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**BOSTON WHOLESALE
FOOD DISTRIBUTION FACILITIES**

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Agricultural Research Service
U.S. DEPARTMENT OF AGRICULTURE //

PREFACE AND ACKNOWLEDGMENTS

This study describes the wholesale marketing facilities in Boston, estimates the costs of handling food through those facilities, and presents plans for new and more adequate facilities.

A series of presentations of the highlights of the study were made at public meetings in Boston in the spring of 1964. Since that date, extensive use of the data has been made by planning groups and developers in the Boston area.

Grateful appreciation is extended to many wholesale firms in the Boston area who cooperated in furnishing data and especially to wholesalers who furnished cost data, which made possible accurate cost determinations. Appreciation is also extended to local Federal, State, and city agencies, especially the Boston Redevelopment Authority.

Special recognition is due Daniel J. Ahern, director of the Waterfront Redevelopment Corporation, Martin R. Adler, Waterfront Redevelopment project coordinator for the Boston Redevelopment Authority, and Michael Nelson, project leader of Stanford Research Institute. Mr. Nelson directed the collection and analysis of basic data on the volume, flow, and costs of handling food commodities through the present market

under a contract between the U.S. Department of Agriculture (USDA) and Stanford Research Institute.

The following members of the Marketing Facilities Development Branch, Transportation and Facilities Research Division, Agricultural Research Service, contributed to this study: Kenneth L. Utter, marketing specialist and former project leader, directed a large part of the research. Paul J. Hanlon, industrial engineer, and Richard K. Overheim, marketing specialist, made up the field survey team for USDA. A. B. Lowstuter, architect, developed the master plan and layouts on the various sites. Robert L. Holland, marketing specialist, designed the layout for the meat facility. Kenneth H. Brasfield, marketing specialist, designed the layout for the poultry and egg facilities. Wellons C. Taliaferro, marketing specialist, designed the layout for grocery facilities. W. E. Blackmore, marketing specialist, assisted in analyzing statistical data. Mr. Utter and Mr. Taliaferro have since left the Department.

This study was prepared under the general supervision of William C. Crow, Director of the Transportation and Facilities Research Division.

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SUMMARY

Development of a new wholesale food distribution center for Boston would save an estimated \$2.8 to \$4.8 million annually in marketing costs. This estimate is based on relocation in the new distribution center of 303 of the 556 independent wholesale firms now serving the Boston area. This group includes dealers in all five of the commodity groups studied—fresh fruits and vegetables; groceries; meat and meat products; poultry, eggs, and dairy products; and frozen foods. Facilities have also been provided for a refrigerated warehouse, dry storage warehouses, and chainstore warehouses.

The city of Boston is actively pursuing an urban renewal program that will force wholesale food firms in the Faneuil Hall market area to relocate. A comprehensive study of all wholesale food facilities in the metropolitan area revealed that many firms, in addition to those in the Faneuil Hall area, were operating in inadequate facilities, which prevented adoption of efficient food handling methods. A food distribution center would solve the problem of relocating most of the food wholesalers.

The facilities recommended for the new food distribution center are designed for the volume of food handled by dealers who would benefit by moving to new facilities or who will be required to move because of urban renewal projects. The rest of the dealers have new or modern facilities, or they operate partly as retailers and would lose their retail business if they moved.

During the study year, an estimated 4.4 million tons of food moved through facilities of 556 independent wholesalers and 6 corporate chains to all parts of Metropolitan Boston and points throughout New England and eastern Canada. Trucks brought about 54 percent of this volume into the city; railroads brought 45 percent; and 1 percent arrived by boat.

The costs of moving nearly 2 million tons of food through the independent wholesale facilities in Boston were estimated at \$45.5 million in the study year. Some of these costs were excessive or unnecessary because of the type or location of the facilities in which the wholesalers operated. Many of the buildings were not designed for food-handling operations, nor could they be adapted for use of modern materials-handling equipment. Many facilities did not have direct rail connections. Locations of wholesale food firms on narrow, busy streets added to the costs of receiving

and distributing food and the cost of transferring commodities between dealers. These factors also affected the amount of spoilage that occurred.

Facilities suggested for the proposed center are 11 multiple-occupancy buildings with 218 units and 30 single-occupancy buildings, including buildings for a public refrigerated warehouse, 2 dry storage facilities, and 2 chainstore warehouses. Food handling operations in all buildings would be on a single level at the height of the floors of rail cars and trucks. Double rail tracks would be at the rear of buildings. The buildings are designed for use of modern materials-handling equipment.

In the layout of the center, the facilities are arranged by commodity groups to maintain efficient operations within the framework of the entire market. Streets should be at least 200 feet wide where buildings face each other, to accommodate market traffic and provide adequate parking.

The area required for the proposed facilities is 171 acres. It is recommended that an additional 75 acres for future use by food wholesalers or by allied industries be included in the initial land purchase.

The cost of six sites considered for development of a wholesale food distribution center varies from \$6.4 to 24.6 million. The suggested facilities would cost an estimated \$31.5 million.

If the center is financed privately and is built on 171 acres varying in cost from \$26,000 to \$100,000 per acre, rentals for the various types of facilities would range from \$1.50 to \$8.10 per square foot. This example does not preclude the use of municipal or State assistance to develop the center, nor the possibility that a private developer might construct the facilities on a leasehold arrangement. Regardless of the financing method, projected operating savings could be realized only if modern materials-handling procedures were used.

In addition to a reduction in marketing costs, benefits could accrue to producers, buyers, wholesale dealers, market employees, transportation agencies, consumers, and the metropolitan area. Operation of price-making and price-reflecting forces would be improved; rail and truck operations would be simplified; quality of food would be easier to maintain; sanitation problems would be reduced; the tax base and revenues could be increased through better economic use of present market areas; and the value of the land used for the new development would increase.

BOSTON WHOLESALE FOOD DISTRIBUTION FACILITIES

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BACKGROUND OF THE STUDY

This study of wholesale food marketing in Boston was initiated in 1962 at the request of Boston city officials and responsible civic agencies. The request was prompted by the activation of the Downtown Waterfront Renewal project, which will force the relocation of one of the major concentrations of food wholesalers in the city. The Waterfront renewal project is a joint undertaking of the Boston Redevelopment Authority and the Boston Chamber of Commerce. Recognizing the need for proper food distribution facilities for the entire city, Boston officials requested the U.S. Department of Agriculture to undertake a comprehensive study of the wholesale food handling facilities in the metropolitan area.

A previous study conducted in 1948 by the Department placed primary emphasis on the Faneuil Hall Market area, because pending highway construction was to displace about 100 food dealers in that section of the city. A result of that study was the construction of a new wholesale meat distribution center in South Boston. However, most of the displaced firms relocated within the Faneuil Hall area, and the food handling situation in Faneuil Hall has not materially changed since that time.

The present study had the following objectives:

- To analyze the wholesale marketing facilities for major food commodities and to determine the adequacy of these facilities in light of present and future needs.
- To estimate the major measurable costs and other factors involved in handling these commodities under present operating conditions.
- To determine the kind and amount of facilities

required to provide efficient wholesale marketing of these commodities, the cost of construction, probable operating expenses, and source of income in the proposed facilities.

- To outline the potential benefits that might be derived from construction of modern wholesale food facilities for serving the metropolitan area.

For purposes of this study, the Boston metropolitan area is defined as the city of Boston and the townships and counties contained within State Circumferential Route 128. In this area there are 65 municipalities. The area covers approximately 97 square miles and has a population of 2.6 million people.

This study was concerned with marketing facilities of independent food wholesalers for the major food groups. The commodities included were fresh fruits and vegetables; groceries; meat and meat products; poultry, eggs, and manufactured dairy products; and frozen foods. In addition, facilities of food chains operating in the area were examined.

All the data relating to the amount of each commodity received by the dealers and the costs of handling the products from point of initial receipt through various wholesale channels were obtained by the contractor. Information was obtained from the wholesale dealers, buyers who patronized the various markets, truckers, railroad officials, labor union officials, representatives of the city, others connected with the wholesale food industry in Boston, and the Market News Service of the U.S. Department of Agriculture. These data were based on calendar year 1961, the latest available data at the time of the study.

FOOD MARKETING IN BOSTON

Boston receives about 4½ million tons of food commodities annually from producing areas throughout the United States and overseas. This

food is distributed by 556 independent wholesale firms and 6 corporate chains to points throughout New England and eastern Canada. Some food

is shipped directly to local processors and retail establishments, and to public warehouses for redistribution to local processors located in and outside Greater Boston. This volume was not included in the study since it does not move through wholesale food facilities within the metropolitan area.

Many trucking firms serve the Boston wholesale food industry. A network of highways extends from the city. Three major railroads—the Boston and Maine, New York Central System, and the New York, New Haven, and Hartford Railroad Co.¹—provide direct service to some wholesale food facilities. In addition, the Union Freight Railroad provides switching service in the downtown waterfront area. These railroads provide team tracks and holding yards for many firms that are not directly served by rail. Foreign and domestic steamship lines serve importers of food commodities through the Port of Boston. Highly specialized food commodities comprise the relatively small percentage of food shipped via air freight.

The total volume of direct receipts arriving in the Boston metropolitan area, by type of operator, commodity, and method of transportation, is shown in table 1. Although this table includes the volume received by the corporate chains, by method of transportation, further analysis of the chains has not been made in this study.²

Truck receipts represented the largest percent-

¹ The New York, New Haven, and Hartford will be referred to subsequently in this report as the New Haven.

² Most of the firms have relatively new facilities, and an analysis of the two firms that might consider relocating would disclose confidential information.

age of direct receipts. The independent grocery, frozen food, poultry, egg, and dairy product firms received more than half of their total volume by truck. For many dealers this represented the most direct method of receiving commodities at their facilities.

Rail receipts accounted for approximately 45 percent of total direct receipts. The largest rail receivers among the independent wholesalers were the fresh fruit and vegetable dealers, followed by the meat and meat products wholesalers. The corporate chains received slightly less than half of their volume by rail. For most wholesalers who had large volumes of rail receipts, access to rail facilities was convenient.

Approximately 3 percent of the direct receipts of independent dealers arrived by boat. Grocery firms represented the largest single group of importers; about 7 percent of their volume was received by boat. Some dairy products, meats, and fresh fruits and vegetables were also imported.

Description of Facilities

In Metropolitan Boston there are three major market areas where wholesale food operations are located: Faneuil Hall, South Boston, and Charlestown. In addition to these clearly defined markets, there are many individual wholesale operations located throughout the metropolitan area. For the purpose of this report the market area for these firms is designated as "Other Boston." Figure 1 shows the location of the Faneuil Hall, South Boston, and Charlestown market areas, the major highways, the railroads, and the international airport.

TABLE 1.—*Volume and percentage of food commodities received, by type of wholesale dealer, commodity, and method of transportation. Boston, 1961*

Type of wholesale dealer and commodity	Volume				Percentage			
	Truck ¹	Rail	Boat	Total	Truck ¹	Rail	Boat	Total
	Tons	Tons	Tons	Tons	Percent	Percent	Percent	Percent
Independent dealers:								
Fresh fruit and vegetables	302, 647	360, 787	1, 588	665, 022	45	54	1	100
Groceries	272, 035	225, 247	38, 092	535, 374	51	42	7	100
Meat and meat products	216, 792	220, 357	6, 178	443, 327	49	50	1	100
Poultry, eggs, and dairy products	124, 173	18, 300	3, 143	145, 616	85	13	2	100
Frozen foods	61, 316	46, 906	-----	108, 222	57	43	0	100
Total	976, 963	871, 597	49, 001	1, 897, 561	51	46	3	100
Corporate chains (all commodities)	1, 350, 684	1, 100, 570	4, 913	2, 456, 167	55	45	0	100
Total	2, 327, 647	1, 972, 167	53, 914	4, 353, 728	54	45	1	100

¹ Includes receipts by air.

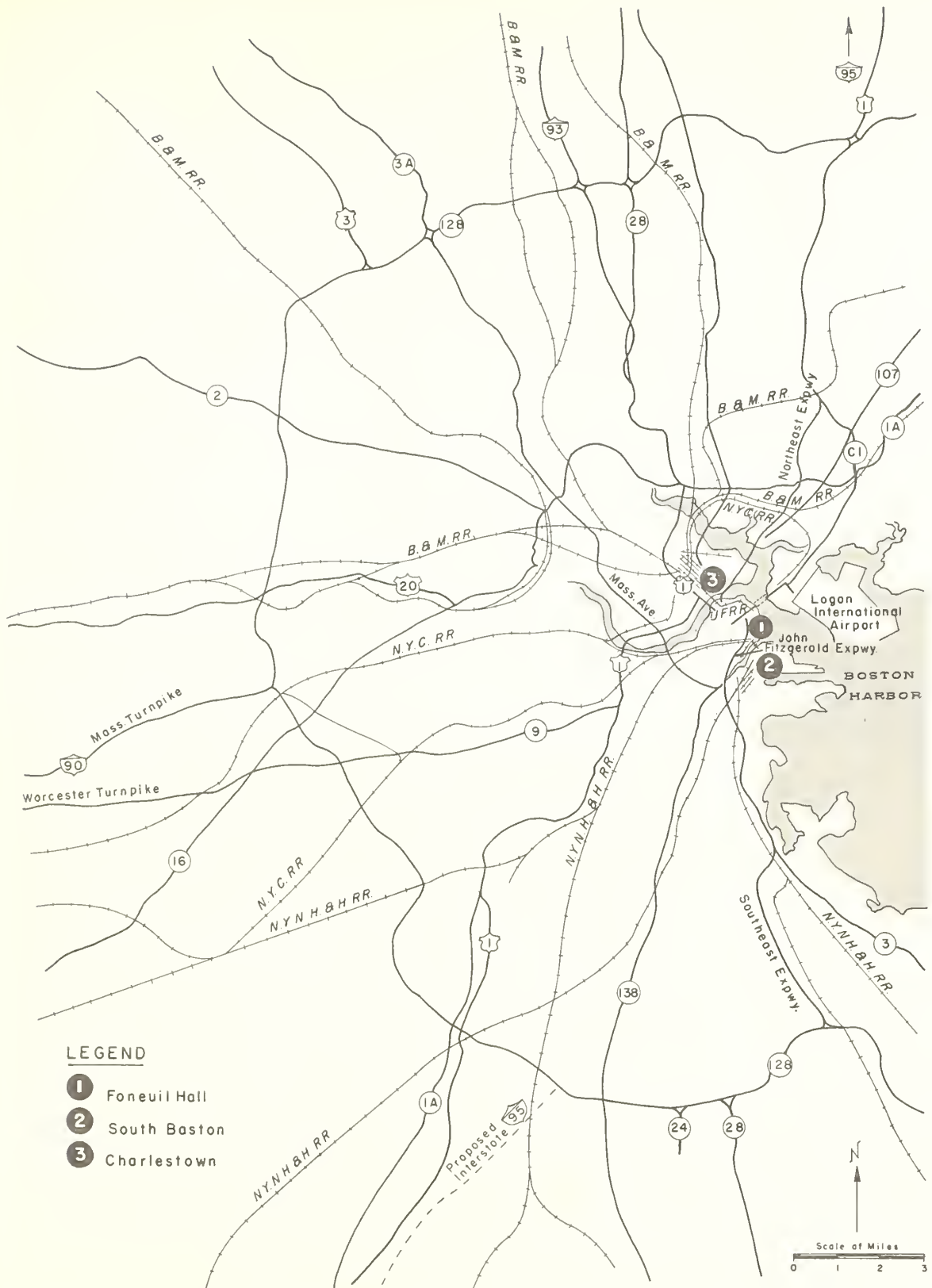


FIGURE 1.—Boston: Location of the Faneuil Hall, South Boston, and Charlestown market areas, the major highways, the railroads, and the international airport.

The largest concentration of dealers is in the Faneuil Hall market. These dealers receive 285,000 tons of food—15 percent of the independent wholesale food volume in the city. The second major market area, South Boston, contains predominantly fresh fruit and vegetable and meat and meat product firms. These firms receive approximately 739,000 tons, or 39 percent of the independent volume. The third major market area is located in Charlestown, where 360,000 tons, or 19 percent of the independent volume, is received. The fourth and final classification of market areas, Other Boston, covers the other independent dealers, who receive approximately 513,000 tons, or 27 percent of the independent volume.

Faneuil Hall Market Area

The Faneuil Hall market has long been a center of food marketing in the city of Boston. In 1740, Peter Faneuil, a leading merchant and importer, recognized the need for improving food marketing facilities in the city and offered a suitable building to accommodate food dealers under the administration of the city. The building contained stalls for sellers on the first floor and a public meeting room on the second floor. A third floor was added as an armory in 1806. The original building underwent major improvements in 1898-99.

In 1826, a long granite structure to the east of Faneuil Hall was completed and officially named "Faneuil Hall Market." This name was later changed to Quincy Market to avoid confusion with the original market building (fig. 2).

Today, these two historic buildings form the nucleus of the Faneuil Hall market area. On streets facing and adjacent to these buildings wholesale food operations have developed without a set pattern. Intermingled with wholesale food firms are restaurants, taverns, and stores dealing in crates, boxes, paper, twine, hardware, store fixtures, clothing, shoes, and many other products. In addition, a number of local express companies maintain loading and assembly points in the market.

This market area is located in the hub of Boston approximately one-half mile from City Hall and the downtown shopping area. The boundaries of the market are Central Street, Congress Street, Dock Square, Union Street, Hanover Street, Fleet Street, Eastern Avenue, and Boston Harbor. The Central Artery, or John Fitzgerald Expressway, splits the market.

The Faneuil Hall market contains 273 wholesale food firms. The 104 fruit and vegetable wholesalers make up the largest group of dealers. The next largest group is 101 meat and meat products firms. There are also 27 grocery, 38 poultry,

egg, and dairy products, and 3 frozen food firms located in and around the Faneuil Hall and Quincy Market buildings. The location of wholesale dealers, by type of commodity handled, is shown in figure 3.

The "push cart" market, located on Blackstone Street between North and Hanover Streets, has not been included as a wholesale operation because sales are predominantly retail. On weekends this area becomes a bedlam where peddlers and small businessmen make retail sales of a variety of foods that have not been distributed through local wholesale food channels.

The Union Freight Railroad provides limited rail access to the market. (See fig. 3.) Direct rail service is limited to stores and wharves along Atlantic Avenue. Other wholesalers receiving food commodities by rail generally use team tracks either in South Boston or Charlestown.

In describing the facilities in the Faneuil Hall market, it is only fitting to begin with Faneuil Hall itself. This historic structure is 81 feet wide and 103 feet deep, and it contains three floors and a basement. Only the basement and first floor of the building are used for food handling activities.

The first floor of the building is slightly above street level. Interior space of the first floor is divided into stalls. These stalls range from 12 to 30 feet in width and average 14 feet in depth. Glass-fronted coolers and display cases face the aisles which extend the length of the building. Most stalls have small mezzanine cubicles used for office space.

The basement of the building is divided into units of various sizes by stone partitions. Each unit has one narrow opening at street level. All merchandise must move through this narrow passageway, down steep stairs, into the basement work and sales area. The reverse process must be repeated when merchandise is sold. There is no access between individual units. The sidewalk surrounding the building is about 10 feet wide with an 8-inch curb and a covered canopy.

There were 15 meat and meat products dealers and 1 fruit and vegetable dealer using about 5,000 square feet of space in the basement and first floor of Faneuil Hall. These firms engaged in both wholesale and retail operations.

The Quincy Market building is about 50 feet wide and 535 feet long, with two stories and a basement. The basement and first floor are used for the physical handling of food commodities; the second floor provides office space for dealers or brokers.

The first floor is raised about 3 feet above the level of the sidewalk. Inside, a center walkway extends the entire length of the first floor (fig. 4). On either side of the walkway, stalls are available



N-48626

FIGURE 2.—Faneuil Hall is the three-story building with a cupola at left center; the long building in the foreground is Quincy Market. Many of the buildings to the rear of Faneuil Hall have been demolished for the new government center.

for dealers to display and sell food commodities. Above the stalls, space is provided for either mezzanine offices or storage. The stalls vary from 12 to 45 feet in width and 18 to 22 feet in depth; they are 18 feet high. A restaurant is provided on the first floor of the building.

Here, as in Faneuil Hall, access to the basement stores is by steep, narrow stairways. Some firms have excavated under the sidewalk to obtain additional space. Dealers who occupy basement units are permitted to use sidewalks for display at no additional cost. These sidewalks average 24 feet wide and are covered by a canopy.

Many fresh fruit and vegetable dealers with facilities in the building store their products on the sidewalk and often stack them in the street. Occasionally a dealer conducts the major part of his business from the sidewalk. Although a city ordinance requires a 4-foot continuous walkway around the market building, there are periods

when a two-wheel handtruck can barely pass the stacks of merchandise. Often, in periods of peak sales, large quantities of produce are stored overnight on the sidewalk surrounding the building.

Refrigerant is supplied to both Quincy Market and Faneuil Hall by a local cold storage company. At the time of the study, there were plans to discontinue this service and many firms had installed their own refrigeration equipment.

The streets that surround the market buildings are inadequate to handle normal market traffic. The problem of antiquated buildings served by narrow streets has been general in Boston for almost a century (fig. 5). To this situation, add several thousand motor vehicles engaged in non-market business, along with the necessary market traffic needed to transfer food items between wholesale facilities, markets, and retailers, and the result is frequent massive traffic tieups in the Faneuil Hall market. These tieups result in cost-

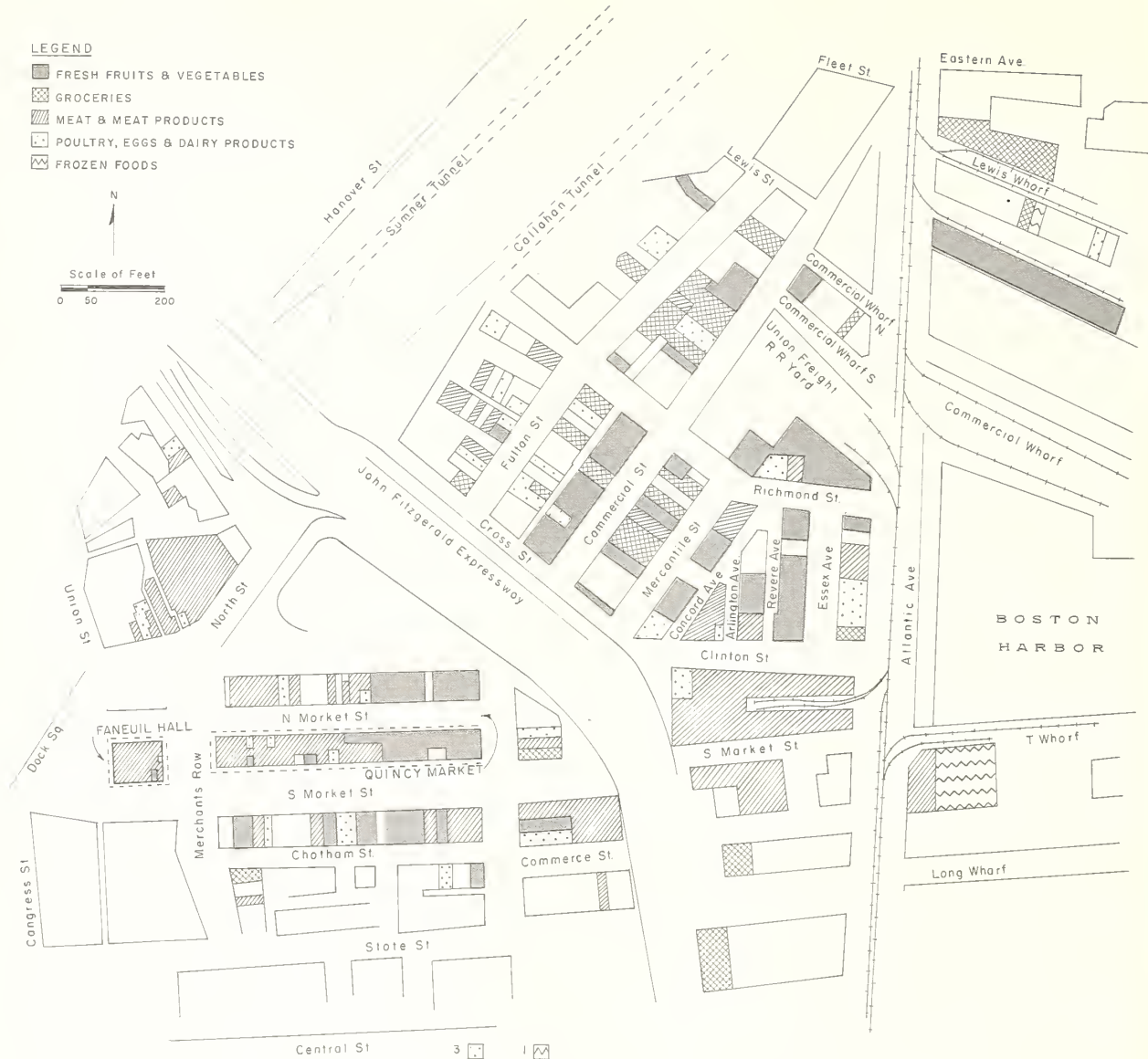


FIGURE 3.—A land use map of the Faneuil Hall market area.

ly delays in the transfer of food between wholesalers and consumers. Attempts have been made to alleviate the traffic situation by rigid enforcement of regulations. Congestion is always a problem during market hours, however, because the streets are not wide enough to permit both efficient traffic flow and necessary space for unloading and parking.

Many of the buildings that surround the market were constructed during the colonial era. These brick or stone structures contain from one to six stories with access to the upper levels by stairs or slow freight elevators. Difficulties are often encountered with work procedures and equipment utilization because stairways, elevator

shafts, or support columns prevent improvements in layouts. In most buildings it is impossible to have proper aisle spacing; storage on upper levels is required, which makes additional labor necessary to handle the products. The floors of these buildings are often too weak to permit efficient stacking methods. In some meat facilities rails for efficient handling are nonexistent.

Generally, the basements are damp and subject to flooding at high tide, and thus are unsuitable for food handling.

Few facilities have either a front or rear platform, and the sidewalk has to be used for loading and unloading operations. In some cases, sidewalk space is rented from adjacent firms.



N-48603

FIGURE 4.—The first floor sales area of the Quincy Market building. Note the mezzanine offices.

High fire insurance rates are common because of the age and condition of these buildings. Available toilet facilities are antiquated, poorly located, and unsanitary.

With the construction of the John Fitzgerald Expressway, the Faneuil Hall market was divided into two areas. Some of the wholesalers located on the east side have remodeled their buildings in an attempt to make the interior layout more efficient within the limitations of these old buildings. However, the firms on the east side were isolated from the main market by new traffic patterns, such as one-way streets and ramps that provide access to the elevated highway. This has created artificial barriers to customer traffic.

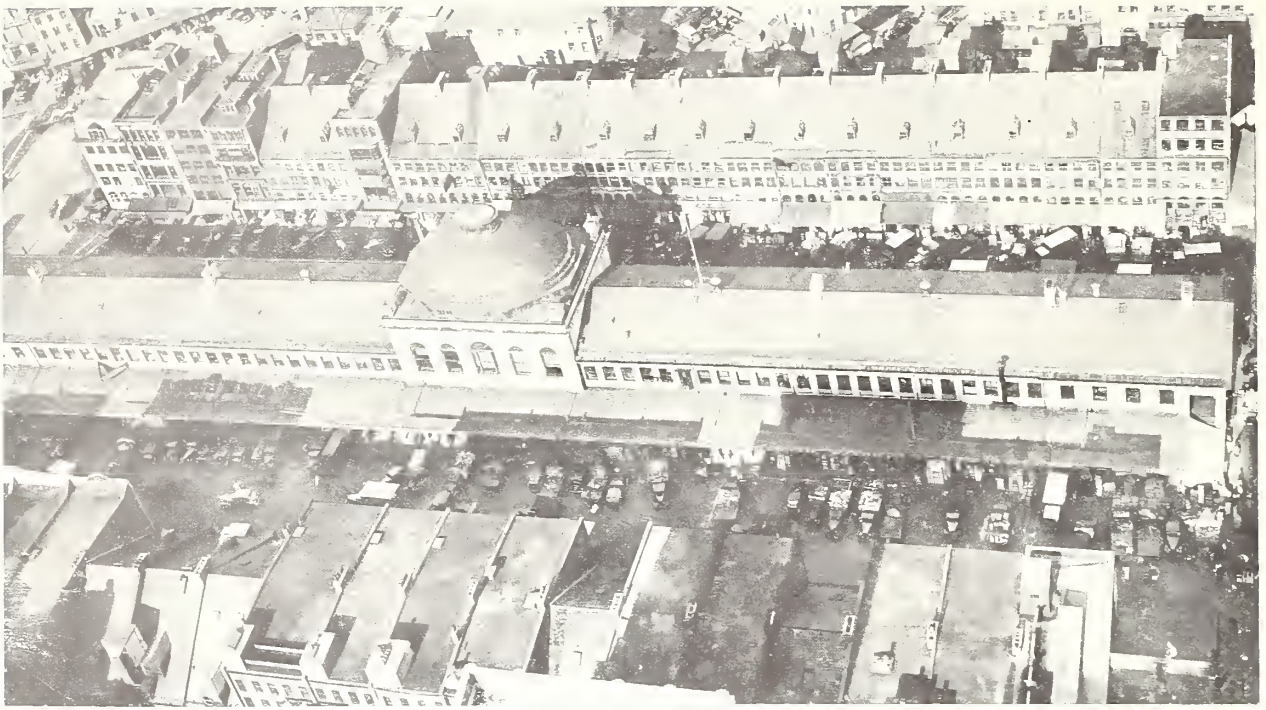
South Boston Market Area

A total of 96 wholesale food dealers are located in South Boston. Most of these firms are in two

locations: 46 are in or near the Boston Market Terminal and 46 are at Newmarket, which is about 1.5 miles from the terminal. The other 4 firms are outside these two areas.

Figure 6 shows the location of food wholesalers, by commodity, in the immediate area of the Boston Market Terminal and at Newmarket.

The Boston Market Terminal was formed in the 1920's, when three freight sheds in South Boston owned by the New Haven were converted into wholesale food marketing facilities. These three sheds, together with the adjacent team tracks, were used for receiving and wholesaling fresh fruits and vegetables. Some of the multiple- and single-story warehouse buildings surrounding the original facilities have been taken over by various firms engaged in the handling of food commodities. These include grocery and fruit and vegetable firms, a frozen food firm, food chain warehouses, coffee roasters, and extract and spice merchants.



PMA 6676

FIGURE 5.—View of the antiquated buildings and the narrow streets that serve the Quincy Market building.

In addition, nonfood firms located in the market include trucking companies, plumbing and warehouse suppliers, wool storage warehouses, and scrap yards.

The Boston Market Terminal facilities consist of two of the original sheds; at the time of the study the other building was leased to the U.S. Post Office and was not used for food handling. The two buildings presently occupied by the terminal are called "11 House" and "12 House." These buildings provide space for fresh fruit and vegetable dealers and offices for food brokers. The buildings are of reinforced concrete with brick facing. There are 43 independent fresh fruit and vegetable dealers, 2 grocery firms, and a frozen food firm in these and other buildings near the terminal.

The Boston Market Terminal is the primary receiver of fresh fruits and vegetables in the Boston area. Formerly owned and operated by the New Haven, it is presently owned by a closed corporation consisting of fresh fruit and vegetable receivers operating in the terminal.

Since the terminal has become a private corporation, over-the-road trucks are permitted to use the facilities. To encourage this business an open platform has been added to one of the terminal buildings. Access to this platform is by paved driveways from Fargo Street or from C Street. However, congestion is often a problem on C Street because of the loading out operations of the terminal and the independent firms across

the street. This activity narrows the roadway to a single lane (fig. 7). As a result, considerable delay is often encountered.

The New Haven serves the terminal by direct rail and team tracks, which are adjacent to the facilities. The major portion of the fresh fruits and vegetables that move through this market are unloaded from the team tracks into the buyers' trucks rather than being handled through the terminal facilities.

The enclosed sections of the two buildings of the terminal company at C and Fargo Streets contain about 98,000 square feet of first floor space where up to 250 carlots of fruits and vegetables can be unloaded for display and sale. Neither building is equipped with refrigeration, and fruits and vegetables that are not sold must be reloaded into rail cars.

Horse tracks, which parallel the two houses, along with adjacent team tracks, provide space for 300 cars. This facility offers a daily capacity of about 550 carlots, although it rarely utilizes more than 50 carlots per day. Most of the streets surrounding these buildings and the team track areas are paved.

The platforms extending from the two terminal houses are 39 inches high. Bridge plates can be used in unloading rail cars and loading trucks.

A partial second floor at the front of the buildings is about 115 feet deep. Passageways at the second floor level connect the buildings. Second floor space is occupied by offices of the Boston

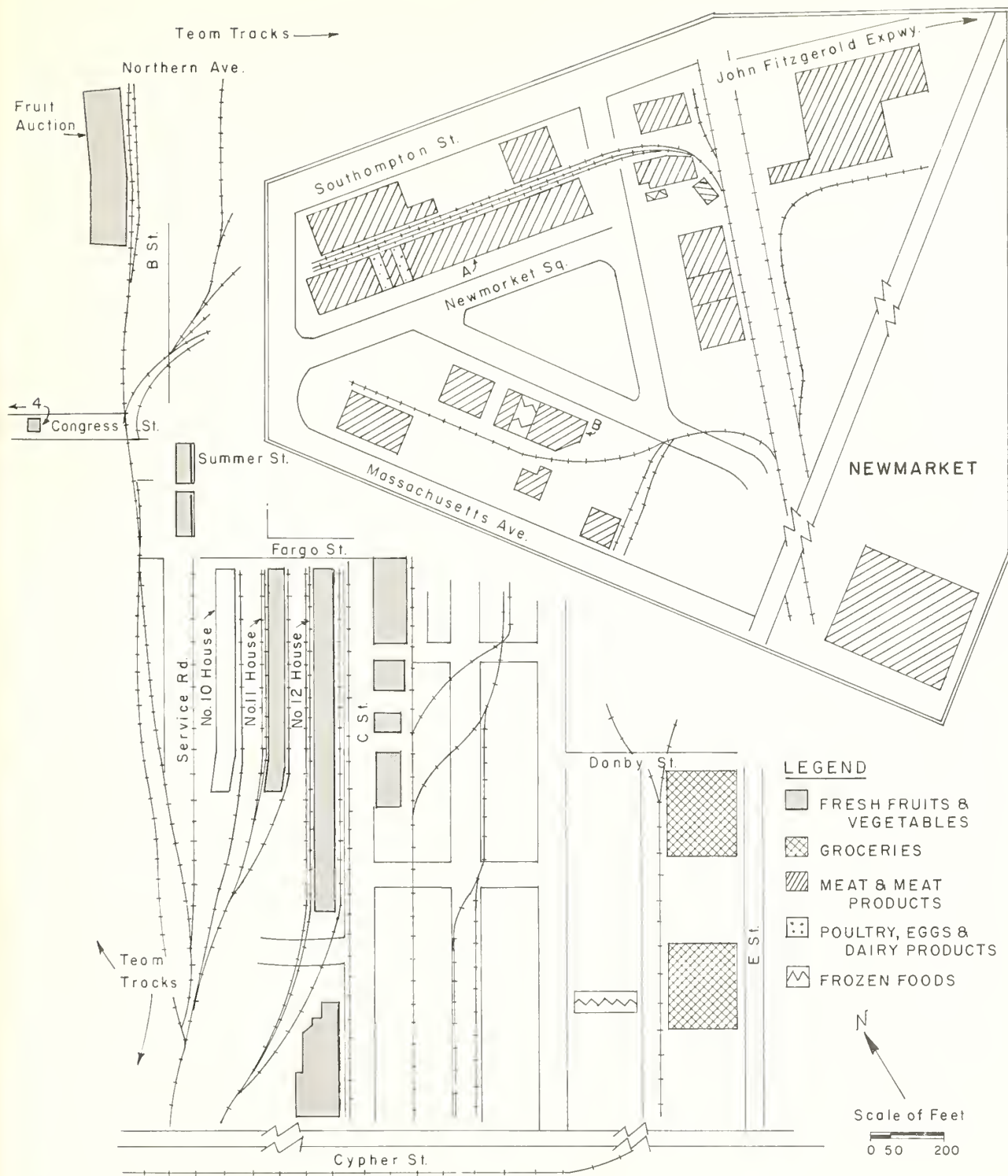


FIGURE 6.—South Boston: Wholesale food facilities at Newmarket and the Boston Market Terminal and immediate vicinity.



N-48636

FIGURE 7.—Trucks loading at the terminal facilities and at dealers' stores opposite permit only one-lane traffic.

Market Terminal Co., its individual member firms, brokers, a private inspection bureau, a telegraph company, a barber shop, and a restaurant.

Located on Northern Avenue adjacent to this market district is the fruit auction that was for-

merly in Charlestown. This facility is a brick building 682 feet long and 195 feet wide. The auction occupies about 83,000 square feet at the north end of the building. This 1½-story building has 30 bays, each with a roll-up door on B Street. The bays are served by a 52-inch-high rear rail platform and a 45-inch-high front truck platform. The interior is divided into four areas. One area is used as headquarters for a stevedoring company and for employee welfare rooms. Bays 1 through 10 are heated in cold weather for citrus fruit. Bays 11 through 28 are general sales space. The other two bays are leased to a trucking company for general freight operation. The partial second floor provides offices for the auction company, citrus cooperatives, and brokers.

The facilities of the grocery firms, the frozen food firm, and the other fruit and vegetable firms near the terminal are old multistory and converted one-story warehouses. Some of these firms are in makeshift facilities adapted to their require-



BN-25599

FIGURE 8.—Newmarket: Buildings A and B are multiple-occupancy buildings. Other buildings around the triangular parking lot are single-occupancy buildings.

ments. Most firms are served by direct rail; others use the team tracks for rail receipts.

In 1950, 20 meat dealers, who had to move from Faneuil Hall because of highway construction, formed the Massachusetts Food Wholesale Corp. This group cooperated with the New Haven railroad in developing in South Boston new facilities that became known as Newmarket (fig. 8). At the time the market was built, two major meat firms constructed plants adjacent to this site on the east side of the New Haven railroad.

The boundaries of Newmarket form a triangle between Massachusetts Avenue, Southampton Street, and the John Fitzgerald Expressway (fig. 6). The area contains 42 meat, 2 poultry, egg, and dairy product, and 2 frozen food firms.

Building A, Building B, and the parking lot remain under the control of the development corporation. Building A is about 750 feet long and 128 feet deep, including front and rear platforms. It contains 11 multiple-occupancy units that are approximately 32 feet wide and 15 units that are 25 feet wide. These units are completely refrigerated on the first floor. The front platforms are 16 feet wide and at truckbed height, and the rear platforms are 14 feet wide and at rail-car-floor height. The front half of the second floor is generally occupied by offices, welfare rooms, and refrigeration equipment of the tenants. The equipment room and the office area each have a separate entrance to the hallway. The back part is used for a restaurant, offices, and general storage. The second floor area is served by a freight elevator at the end of the building. A double rail spur behind this building has a capacity of about 30 cars. The second track is rarely used because of the rapid turnover provided by a contract stevedoring company. The rear entrances of these multiple units are used exclusively for rail unloading.

Building B contains 14 refrigerated units. Each unit in this building is 25 feet wide and 100 feet deep with a 16-foot-wide front platform. The rear platform is 16 feet wide, but gradually diminishes to a foot-wide bumper guard along the ends of the building. The second floor of this building is similar to that of building A, with offices in front and storage space in the rear.

In addition to the two multiple-occupancy buildings, there are several single-occupancy buildings ranging from 6,600 to 96,000 square feet. In general, these are two-story buildings, relatively new, and designed specifically for individual meat operations.

Charlestown Market Area

Before the turn of the century, the Boston and Maine Railroad provided facilities just off City Square on Front Street in Charlestown for the unloading and storing of potatoes brought from points to the north and northeast. This area became known as the Charlestown potato yards

(fig. 9). Across from the Warren Bridge in Charlestown the railroad also provided a building for the fruit and produce auction. During the same period a team track for the receipt of wine grapes was built in the area.

The Charlestown market has undergone substantial changes in food wholesaling. The grape yards, which once handled 5,000 cars of grapes a year, are not being used. The fruit and produce auction has relocated its facilities in the South Boston market. The potato sheds, which provided facilities for 10 fresh fruit and vegetable dealers, have been partially destroyed by fire. Some of these dealers are operating in makeshift or partially repaired facilities.

At the time of the study, there were 12 wholesale fresh fruit and vegetable dealers, 10 of which handled only potatoes. Other wholesale facilities in Somerville and East Cambridge, consisted of 6 grocery, 6 meat and meat products, and 5 poultry, egg, and dairy products operations.

The approximate boundaries of Charlestown market are Austin Street, Lynde Street, Warren Avenue, the Charles River, and Front Street (fig. 10).

Highway access is poor and it is necessary to go through the downtown section of Charlestown to gain bridge access to Boston or to the highways north and west.

Generally, most firms are served by direct rail or the team tracks provided by the railroad. The firms located in the potato sheds are served directly by rail and are efficient because only one commodity is handled through their facilities.

In the other commodity groups located within this area, there has been a shift from the small independent wholesalers in low rental facilities to dealers handling large volumes. The facilities of most of these firms have kept pace with the change.

Firms have remained in the Charlestown market area mainly because they are located close to their customers.

Other Boston

There are many wholesale food firms that are not located in a clearly defined market area. Many of these firms are situated where they can best serve their customers. Others are located outside specific markets for reasons of economy or because congestion and other conditions in the markets would interfere with their operations.

The area defined as Other Boston includes wholesale dealers within the boundary of State Circumferential Route 128 that are not in any previously described market. These scattered operations consist of 28 fresh fruit and vegetable, 66 grocery, 27 meat and meat products, 28 poultry, egg, and dairy products, and 9 frozen food firms. In addition, six corporate chain warehouse facilities are located in Other Boston.

Highway access depends on the individual firm's choice of location. In many cases access to major highways is not important because of the area



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FIGURE 9.—Part of the Charlestown potato yards; rail facilities at the rear of the building do not permit loading directly into trucks from rail cars.

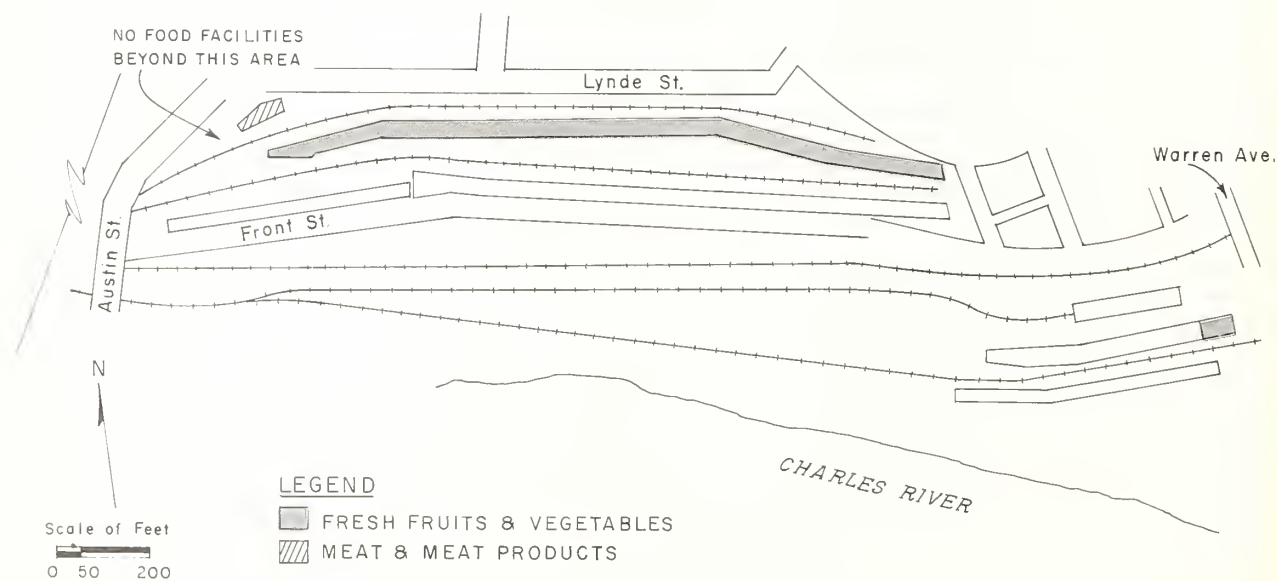


FIGURE 10.—Land use map of the Charlestown market area.

served. The individual firms with sufficient volume moving some distance have reasonably good access to major highways.

Direct rail service is available to some firms. Other wholesalers receive commodities on team tracks either in South Boston or in Charlestown.

There is considerable variation in the facilities of the 28 fresh fruit and vegetable dealers. Two prepackaging firms are considered highly efficient; other firms scattered throughout the city are located in garages or converted retail stores.

More grocery firms maintain facilities in scattered areas of Boston than in any specific market area. Small-volume or highly specialized jobbers occupy converted stores or garages or operate from makeshift facilities. Large-volume firms operate out of converted mills or industrial warehouse buildings. A few firms maintain highly efficient operations within facilities specifically designed for their use.

The facilities of the meat and meat products firms, which include two slaughterers, are mostly multistory brick or stone buildings. Many of these firms have made attempts to improve their operations, but they were rather limited by obsolete buildings.

The poultry, egg, and dairy products facilities range from inefficient to highly efficient operations. These firms are generally in their particular location by choice and do not suffer from lack of adequate access to major transportation facilities.

Most of the frozen food dealers are located in a refrigerated warehouse in Watertown. This facility offers excellent transportation access and, because of location, a minimum of handling of a highly perishable commodity. The frozen food firms are the only operators in Other Boston who are grouped together. Generally, whether by choice or policy, the scattered firms do not attempt to develop a specific market area.

Tenure Status and Space Use

Approximately two-thirds of the independent wholesale firms in Boston rented their facilities in 1962 (table 2). The greatest number of firms owning their facilities were in the Other Boston areas.

Total space occupied by the 556 independent dealers amounted to almost $4\frac{1}{2}$ million square feet, or about 100 acres. The average amount of space per dealer was 7,800 square feet.

First floor or effective operating space, for all market areas, was not quite 60 percent of the total space. Of the area devoted to special use, 800,000 square feet was for coolers, 140,000 square feet for freezers, and 260,000 square feet for offices. Forty percent of the cooler space was in South Boston where the meat dealers were concentrated. Frozen food dealers at Watertown (Other Boston) accounted for 66 percent of the freezer space.

Of the 187 fresh fruit and vegetable firms, about 62 percent rented their facilities. Fresh fruit and vegetable dealers often operated facilities in more

than one location. In such cases, the location and tenure status of the primary place of business was recorded, and the space occupied in other markets was included in the figures for those markets.

Fresh fruit and vegetable dealers occupied about 878,000 square feet, or 20 acres. About 62 percent of the total was first floor operating space. Slightly more than 10 percent of the total space was refrigerated. Fresh fruit and vegetable firms located in Faneuil Hall averaged 3,900 square feet, and those in South Boston averaged 5,100 square feet.

Sixty percent of the 104 grocery firms rented their facilities. This percentage is lower than that of any other commodity group. The largest number of firms owning their facilities was located in Other Boston. Of the 1.4 million square feet, or 33 acres, of total space, about 53 percent was first floor operating space. Only 7 percent was refrigerated; 4 percent was used for offices. The average space occupied by grocery firms ranged from 12,000 square feet in Other Boston to over 35,000 square feet in South Boston.

Of the 176 wholesale meat dealers, 75 percent rented their facilities. If operating companies rented from real estate companies and the same individual owned the major share of both companies, the operating firms were considered owners. Meat dealers at Newmarket who rented units in multiple-occupancy buildings, but were stockholders in the Massachusetts Wholesale Distribution Corp., were considered as owners. Firms who subleased were classified as renters.

Ninety percent of the meat firms in Faneuil Hall rented their facilities. The largest number of firms owning facilities was found in South Boston, which included the Newmarket facilities.

Of the total space used by meat dealers, 36 percent was in coolers, 22 percent in freezers, and 7 percent in offices. South Boston had 30 percent of the total space. The 42 firms located in the market averaged 15,000 square feet per firm. Faneuil Hall contained the largest number of dealers and ranked second in amount of space used, averaging 4,700 square feet per firm.

Seventy percent of the poultry, eggs, and dairy products dealers rented their facilities. The largest number of firms renting were located in Faneuil Hall Market, and the largest number owning were located in Other Boston. None of the firms in South Boston owned their facilities.

Poultry, egg, and dairy products firms used about 335,000 square feet, or 8 acres, of which 60 percent was first floor space. Coolers accounted for 15 percent; freezers, 1 percent; and offices, 6 percent of total space. Almost half of the available space of poultry, egg, and dairy firms was used by the dealers located in Faneuil Hall. These dealers had only 43 percent of their space on first floors. The average firm had about 4,000 square feet. Other Boston had the second largest group of these firms and was second in amount of space

TABLE 2.—*Tenure status and space use of independent wholesale food dealers, by commodity group and market area, Boston, 1962*¹

Commodity and market area	Tenure status			Space occupied				Special use ²		
	Rent	Own	Total	First floor	Other floors	Total	Average space per wholesaler	Cooler	Freezer	Office
Fresh fruits and vegetables:	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>	<i>Square feet</i>
	79	25	104	209, 638	195, 693	405, 331	3, 897	36, 006	32	17, 904
	Faneuil Hall.....	17	43	156, 050	61, 900	217, 950	5, 069	35, 066	0	28, 835
	South Boston.....	26	12	37, 100	15, 625	52, 725	4, 394	120	0	2, 300
	Charlestown.....	10	2	138, 895	62, 890	201, 785	7, 207	21, 424	1, 544	5, 774
Total or average.....	117	70	187	541, 683	336, 108	877, 791	4, 694	92, 616	1, 576	54, 813
Groceries:										
	16	11	27	82, 816	256, 165	338, 981	12, 555	14, 363	2, 644	16, 124
	Faneuil Hall.....	4	5	143, 700	32, 400	176, 100	35, 220	9, 200	600	8, 200
	South Boston.....	2	6	97, 740	32, 470	130, 210	21, 702	10, 300	1, 500	7, 655
	Charlestown.....	40	66	443, 240	349, 325	792, 565	12, 009	62, 247	3, 925	29, 344
Total or average.....	62	42	104	767, 496	670, 360	1, 437, 856	13, 826	96, 110	8, 669	61, 323
Meat and meat products:										
	92	9	101	179, 049	298, 537	477, 586	4, 729	159, 513	13, 574	36, 107
	Faneuil Hall.....	21	42	450, 008	187, 210	637, 218	15, 172	279, 770	10, 624	61, 054
	South Boston.....	2	6	42, 175	51, 100	93, 275	15, 546	11, 180	1, 400	3, 986
	Charlestown.....	16	27	223, 350	64, 625	287, 975	10, 666	85, 513	10, 255	9, 810
Total or average.....	131	45	176	894, 582	601, 472	1, 496, 054	8, 500	535, 976	35, 853	110, 957
Poultry, eggs and dairy products:										
	30	8	38	66, 354	88, 619	154, 973	4, 078	18, 611	3, 880	7, 907
	Faneuil Hall.....	0	3	7, 900	4, 000	11, 900	3, 967	6, 375	300	455
	South Boston.....	3	5	42, 630	16, 000	58, 630	11, 726	17, 030	150	3, 514
	Charlestown.....	18	28	89, 025	20, 250	109, 275	3, 903	9, 738	600	6, 679
Total or average.....	51	23	74	205, 909	128, 869	334, 778	4, 524	51, 754	4, 930	18, 555
Frozen food:										
	2	1	3	6, 250	0	6, 250	2, 083	0	1, 250	56
	Faneuil Hall.....	2	3	15, 750	6, 750	22, 500	7, 500	600	11, 175	1, 714
	South Boston.....	9	9	145, 200	21, 435	166, 635	18, 515	22, 600	76, 400	16, 500
	Other Boston.....									
Total or average.....	13	2	15	167, 200	28, 185	195, 385	13, 026	23, 200	88, 825	18, 270
Totals and averages:										
	219	54	273	544, 107	839, 014	1, 383, 121	5, 066	228, 493	21, 380	78, 098
	Faneuil Hall.....	44	96	773, 408	292, 260	1, 065, 668	11, 101	331, 011	22, 699	100, 258
	South Boston.....	17	29	219, 645	115, 195	334, 840	11, 546	38, 630	3, 050	17, 455
	Charlestown.....	94	158	1, 039, 710	518, 525	1, 558, 235	9, 862	201, 522	92, 724	68, 107
Total or average.....	374	182	556	2, 576, 870	1, 764, 994	4, 341, 864	7, 809	799, 656	139, 853	263, 918

¹ Based on data collected by USDA survey team during 1962.² Special use figures are included in space occupied.

TABLE 3.—*Number of independent wholesale food dealers and volume of direct receipts, by commodity and market area, Boston, 1961*

Commodity	Faneuil Hall		South Boston		Charlestown		Other Boston		Total	
	Dealers	Volume	Dealers	Volume	Dealers	Volume	Dealers	Volume	Dealers	Volume
	Number	Tons	Number	Tons	Number	Tons	Number	Tons	Number	Tons
Fresh fruits and vegetables.....	104	129, 565	43	324, 664	12	138, 733	28	72, 060	187	665, 022
Groceries.....	27	37, 140	5	139, 974	6	157, 432	66	200, 828	104	535, 374
Meat and meat products.....	101	57, 418	42	240, 777	6	48, 875	27	96, 257	176	443, 327
Poultry, eggs, and dairy products.....	38	56, 180	3	24, 850	5	15, 187	28	49, 399	74	145, 616
Frozen food.....	3	5, 125	3	8, 750	0	0	9	94, 347	15	108, 222
Total.....	273	285, 428	96	739, 015	29	360, 227	158	512, 891	556	1, 897, 561

used, about 33 percent of the total. These dealers had 81 percent of their space on the first floor.

Thirteen of the wholesale frozen food dealers rented their facilities. Of these firms, 12 were tenants in public refrigerated warehouses. Frozen food dealers utilized 195,000 square feet, of which 86 percent was first floor space. Of this total, 45 percent was in freezers, 12 percent in coolers, and 9 percent in offices.

Volume of Receipts and Number of Wholesalers

The total volume of food commodities received in Boston by independent dealers was slightly under 2 million tons. The fresh fruit and vegetable firms received 35 percent of the total tonnage; the grocery firms were next with 28 percent; the

meat and meat products firms received 23 percent; the poultry, eggs, and dairy products, 8 percent; and frozen food firms 6 percent. The volume of receipts of these commodities by market and number of dealers may be seen in table 3.

Dealers in each commodity group were classified according to function. These functions vary according to type of operation and services performed by the wholesalers. Such classifications were necessary to determine the needs of individual firms and recommendations for improvement. The number and type of dealers, by commodity and market area, are shown in table 4.

Fresh Fruits and Vegetables

Fresh fruit and vegetable wholesalers were classified as carlot receivers, jobbers, or commodity specialists.

TABLE 4.—*Number and type of independent wholesale food dealers, by commodity and market area, Boston, 1961*

Commodity and type of dealer	Faneuil Hall	South Boston	Charlestown	Other Boston	Total
<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>
Fresh fruits and vegetables:					
Carlot receivers.....	16	27	4	3	50
Jobbers.....	61	6	0	18	85
Commodity specialists.....	27	10	8	7	52
Groceries:					
Carlot receivers.....	8	5	3	14	30
Jobbers.....	6	-----	3	15	24
Importers.....	10	-----	-----	3	13
Sundry specialists.....	3	-----	-----	34	37
Meat and meat products:					
Processors.....	10	6	3	6	25
Purveyors.....	67	4	3	13	87
Wholesalers.....	24	32	-----	8	64
Poultry, eggs, and dairy products:					
Poultry.....	11	3	-----	8	22
Eggs.....	3	-----	-----	3	6
Dairy products.....	19	-----	5	14	38
Combinations.....	5	-----	-----	3	8
Frozen food dealers.....	3	3	-----	9	15
Total.....	273	96	29	158	556

Carlot receivers were large-volume firms who handled carlot or carlot equivalents direct from shipping points. They usually carried a full line of fresh fruits and vegetables. These firms sold to other wholesalers, jobbers, retail stores, large institutional outlets, or chainstore warehouses.

Jobbers were those firms who made substantial purchases from other dealers on the market, but occasionally received direct shipments either in full- or pool-car capacity. These firms normally operated on a smaller scale than the carlot receivers and sold in smaller quantities to restaurants or retail outlets.

Commodity specialists were those firms who performed a service and usually specialized in one product. Some of these functions were ripening, cutting, and storing bananas; ripening and pre-packing tomatoes; preparing premixed vegetable salads; and packaging consumer items. They also received, stored, prepackaged, or shipped potatoes, onions, and other products. They sold to wholesalers, jobbers, retail stores, or institutions.

Over half of the 187 fresh fruit and vegetable dealers in Boston were located in Faneuil Hall market. These dealers handled only 19 percent of the direct receipts, however, because most of them were small jobbers. Nearly half of the total volume of direct receipts was handled in South Boston, where the greatest number of carlot receivers was located.

Fresh fruits and vegetables originated in 41 States and several foreign countries. California, Florida, and Maine were the three principal supply areas. Less than 1 percent of the total volume of fresh fruits and vegetables originated in Canada. Truck receipts accounted for 45 percent of the total volume and rail receipts, 54 percent. Less than 1 percent arrived by boat.

Groceries

The term groceries as used in this report applies to food and nonfood items commonly found in a retail store, with the exception of seafoods, fresh meat and meat products, poultry, eggs, and dairy products, fresh fruits and vegetables, frozen foods, and bakery products. In general, wholesale grocery firms in Boston did not handle products that required refrigeration.

The grocery dealers were classified by type of operation as follows:

Receivers were large-volume firms who usually handled car or truck lots direct from shipping points outside Metropolitan Boston. These firms did not specialize in a single function or commodity but handled a general line.³ Included in this category were institutional suppliers.

Jobbers received commodities from points within Boston, with occasional purchases direct from

the processor. These firms sold in small quantities to restaurants and retail outlets.

Sundry specialists received specialty and miscellaneous items that were ordinarily retailed with food, such as candy, tobacco, health and beauty aids, store supplies, and certain soft goods.

Importers received commodities from overseas, through Boston port facilities or other seaport facilities in the country. Occasionally they acted as brokers.

In the Boston metropolitan area, there were 104 independent grocery firms. There was less tendency toward centralization in this commodity group than in any other.

Approximately 535,000 tons of direct receipts, or 28 percent of the total independent volume, were handled by grocery wholesalers. These receipts arrived from local sources, all parts of the United States and from points overseas. Of this total tonnage, more than half arrived by truck, of which 49 percent was received by firms in Other Boston. Charlestown led in rail receipts, with 39 percent of the total volume. The largest volume of imports arrived through port facilities in either Faneuil Hall or Other Boston.

Sixty-six grocery wholesalers located in Other Boston handled about 38 percent of direct receipts, and five dealers in South Boston Market handled 26 percent.

Meat

Many types of firms are included in the wholesaling of meat and meat products in the Boston metropolitan area. The classifications used in this report are (1) wholesalers, (2) purveyors, and (3) processors.

Wholesalers received meat in carlots and sometimes acted as brokers. Normally they received carcasses, which they broke, cut, and occasionally boned. They sold meat to retail outlets or other dealers. Normal sources of supply were producing areas.

Purveyors provided specialized services, usually to hotels, restaurants, clubs, airlines, steamship companies, and public institutions. Many purveyors handled relatively small quantities of meat and distributed within Boston. They supplied meat and meat products to specification, in bulk or in small lots of individual portions. Purveyors purchased from wholesalers and processors and resold various cuts for which they had no other outlet to other wholesale dealers. Purveyors received a large part of their supply from the local market.

Processors handled products that required some alteration and usually manufactured sausage, cured products, or other processed meat. Their normal source of supply was producing areas or slaughterers, although specialized cuts were sometimes obtained within the market.

Most purveyors were located in Faneuil Hall, whereas the larger volume wholesalers were located in South Boston. Processors were located

³ A general line consists of 2,000 to 5,000 items, including such nonfood items as soap, paper products, and other household goods.

throughout all market areas and included two slaughterers.

Meat originated in many States and several foreign countries. The leading States supplying meat to the Boston area were Iowa, Nebraska, Kansas, and Illinois. Imported meats were principally from Europe, New Zealand, and Australia.

Of the 443,000 tons of direct receipts of meat and meat products arriving in Boston, about 45 percent arrived by rail. Newmarket facilities in South Boston received about 65 percent of the rail volume. About 45 percent of the total receipts arrived by truck; nearly half of this volume was received in South Boston. Imports by boat generally arrived through the port facilities of Boston.

The largest concentration of meat dealers was in Faneuil Hall, with 101 of the 176 firms. These 101 firms handled only 13 percent of the direct receipts. South Boston, with 24 percent of the dealers, handled approximately 54 percent of direct receipts.

Poultry, Eggs, and Dairy Products

In previous sections, firms were classified according to the function performed. Since it was not practical to classify poultry, egg, and dairy firms according to function, a grouping by commodity was used. The firms were classified as handling poultry or eggs or dairy products, or a combination of these products.

There were 74 independent poultry, egg, and dairy products firms serving the Boston metropolitan area. About 30 percent of these dealers handled poultry, 8 percent handled eggs, 51 percent handled dairy products, and the remaining 11 percent handled a combination of these items. The primary sources of supply for poultry were Maine and southern producing areas. Eggs came from Maine, the Midwest, and Southeast, and butter primarily from the Midwest. The direct receipts of manufactured dairy products by the various fluid milk companies were included in the total volume of direct receipts of this group. Receipts of manufactured dairy products by packer branch houses and other meat dealers, grocery firms, and chain-store warehouses were included under these categories, and therefore are excluded from this group.

About 85 percent of the 146,000 tons received in Boston by independent firms arrived by truck. This represented the largest percentage of truck receipts of any commodity group. These consisted primarily of eggs and poultry, although some were manufactured dairy products.

Rail shipments from the Midwest, generally consisting of dairy products and manufactured items, represented about 13 percent of the direct receipts. Most of these receipts were moved into and distributed from public cold storage facilities by the independent dealers.

Items imported by these dealers included dairy products and some specialty items such as canned

ham. The imported items represented about 2 percent of direct receipts.

Frozen Foods

No attempt was made to classify the 15 frozen food wholesalers serving the Boston area because of their specialized operations.

Several of these dealers served chainstores on a contract basis. Four firms were distributors of nationally known frozen food lines. In addition to the 15 independent dealers, 3 food chains maintained frozen food departments. A close relationship existed between some of these independent wholesalers and food chains. In such cases, the operation was considered independent unless it was operated as a division of the food chain.

Frozen food represented about 6 percent of the total volume received by independent dealers in Greater Boston. Dealers indicated their business was increasing, especially because the restaurant trade was using more and more frozen food.

The relatively high rate of truck receipts of frozen foods of wholesalers in Boston is due to the frozen seafood processed just outside of Metropolitan Boston and frozen potatoes from Maine. The rail receipts consisted of frozen fruits and vegetables usually processed near their production points in California or Florida.

Flow of Commodities Through the Market

Food commodities were received directly at dealers' facilities, team tracks, boat piers, and public warehouses. From these points of initial receipt, the almost 2 million tons of commodities received by independent dealers were unloaded directly into dealers' facilities or onto buyers' trucks, or were delivered to dealers by cartage companies. Commodities received at public warehouses were stored until required by the dealer. Receipts that moved into dealers' facilities were either processed further, held for sale, or displayed. After sale, they were loaded onto the buyer's or seller's trucks for delivery.

This movement of commodities also involved sales and transfers between dealers in different market areas or within the same market. Approximately 19 percent, or 343,000 tons, was re-handled—moved through more than one wholesale facility or handled by more than one wholesale dealer. This included 239,000 tons of products transferred from one market to another within the city (intermarket movement) and 104,000 tons moved between wholesale facilities within the same marketing area (intramarket movement). The actual volume handled in four market areas is shown in table 5.

The distribution pattern for commodities received at Boston markets indicated that 56 percent

TABLE 5.—*Actual volume handled by independent wholesale food dealers, by commodity and market area, Boston, 1961*

Commodity group	Faneuil Hall	South Boston	Charlestown	Other Boston	Total
Fresh fruits and vegetables:	<i>Tons</i>	<i>Tons</i>	<i>Tons</i>	<i>Tons</i>	<i>Tons</i>
Direct receipts.....	129, 565	324, 664	138, 733	72, 060	665, 022
Intermarket transfers.....	40, 272	5, 424	-----	19, 872	65, 568
Intramarket transfers.....	9, 643	11, 069	395	1, 690	22, 797
Total.....	179, 480	341, 157	139, 128	93, 622	753, 387
Groceries:					
Direct receipts.....	37, 140	139, 974	157, 432	200, 828	535, 374
Intermarket transfers.....	14, 799	5, 071	2, 916	50, 905	73, 691
Intramarket transfers.....	3, 925	3, 982	2, 276	7, 578	17, 761
Total.....	55, 864	149, 027	162, 624	259, 311	626, 826
Meat and meat products:					
Direct receipts.....	57, 418	240, 777	48, 875	96, 257	443, 327
Intermarket transfers.....	53, 114	9, 483	2, 481	30, 051	95, 129
Intramarket transfers.....	14, 617	37, 518	76	1, 716	53, 927
Total.....	125, 149	287, 778	51, 432	128, 024	592, 383
Poultry, eggs, and dairy products:					
Direct receipts.....	56, 180	24, 850	15, 187	49, 399	145, 616
Intermarket transfers.....	2, 929	1, 065	207	577	4, 778
Intramarket transfers.....	6, 932	2, 088	-----	257	9, 277
Total.....	66, 041	28, 003	15, 394	50, 233	159, 671
Frozen food ¹	-----	-----	-----	² 108, 222	108, 222
Grand total.....	426, 534	805, 965	368, 578	639, 412	2, 240, 489

¹ Frozen food was not subject to intermarket or intramarket transfers.

² This includes volume of firms located in South Boston and Faneuil Hall.

was distributed within the metropolitan area. The remainder was distributed to points as far away as Canada, the Midwest, and Florida. Distribution within the metropolitan area was made to retailers, processors, and food chains. The following are the volumes of commodities delivered within the metropolitan area to retailers, according to location, and to processors and food chains, and the volume distributed to locations outside the metropolitan area:

<i>Area or outlet, and definition of area</i>	<i>Tons</i>
Metropolitan Boston:	
Hub Boston:	
Bounded by Massachusetts Avenue on the southwest, the Charles River and docks on the north, and South Bay-Fort Point Channel on the east.....	81, 385
Other Boston:	
The incorporated city of Boston, excluding the Hub.....	208, 835
Cambridge-Somerville:	
City of Cambridge and town of Somerville	100, 155
Northeast suburbs:	
The communities between Route 1 north and the coast, within the Standard Metropolitan Statistical Area (SMSA) ¹ exclud-	

¹ SMSA is the area defined by the U.S. Census of Population, 1960. General Social and Economic Characteristics, Massachusetts. Final Report PC (1) 23 Census (U.S. Bureau of the Census). Washington, D.C., 1961.

<i>Area or outlet, and definition of area</i>	<i>Tons</i>
Metropolitan Boston—Continued	
Northeast suburbs—Continued	
ing areas defined as Hub Boston, Other Boston, and Cambridge-Somerville.....	121, 075
Northwest suburbs:	
The communities between Routes 1 and 2 within the Boston SMSA, excluding the areas defined as Hub Boston, Other Boston, and Cambridge-Somerville.....	156, 966
Southwest suburbs:	
The communities between Route 1 south and Route 2 within the Boston SMSA, excluding previously defined areas.....	141, 740
Southeast suburbs:	
The communities between Route 1 south and the coast within the Boston SMSA, excluding previously defined areas.....	93, 312
Processors	2, 378
Food chains.....	171, 687
Total	1, 077, 533
Outside Metropolitan Boston:	
Northeast:	
Maine, the Canadian Maritime Provinces, the coast of New Hampshire, and the northeast coast of Massachusetts.....	142, 720
Northwest:	
New Hampshire, Vermont, Quebec, and the Lawrence-Lowell area.....	119, 791
Western Massachusetts:	
All of Massachusetts, excluding the Boston SMSA, and the Northeast, Northwest, and Southeast areas defined here.....	174, 974

<i>Area or outlet, and definition of area</i>	<i>Tons</i>
Outside Metropolitan Boston—Continued	
Southeast:	
Southeastern Massachusetts, bounded by Route 1 south to the west, the coast to the south and east, and the Boston SMSA to the north.....	103,592
Southwest:	
Rhode Island, Connecticut, New York, and all other areas south and west.....	278,951
Total	820,028
Grand total.....	1,897,561

An explanation of the determination of the flow of each commodity through the various wholesale market areas to retail and other destinations is given in the appendix. Figure 11 illustrates the flow of all commodities through the wholesale food marketing facilities in Boston.

Fresh Fruits and Vegetables

The movement of 665,000 tons of fresh fruits and vegetables through various market channels in Boston constitutes a complex distribution problem. Truck receipts were delivered directly to the dealers' facilities, and boat receipts were delivered in a similar manner by cartage companies. Rail receipts were delivered directly when house tracks were available. However, extensive use was made of team tracks because many dealers lacked direct rail service. About 171,000 tons of rail receipts were unloaded at team track locations. Almost 20,000 tons of this volume was subject to cartage charges because it was carted to dealers' facilities; the remainder was loaded directly into buyers' trucks.

Transfers of fresh fruits and vegetables were necessary because commodity specialists sometimes required fill-in items, or because firms maintained facilities in more than one market. About 88,000 tons, or 13 percent, of the direct receipts were subject to second handling. Three-quarters of this tonnage was transferred between markets, and the balance was rehandled within the same market. The total tonnage handled through Boston market channels was, therefore, 753,000 tons.

Of the volume distributed, 51 percent was to outlets within the city. This volume was either distributed in the seller's trucks or picked up by the buyer. Of the tonnage distributed outside the metropolitan area, about 28 percent moved to the southwest, primarily Rhode Island and Connecticut, 23 percent to western Massachusetts, primarily the Springfield area, 17 percent to the northeast, 17 percent to the northwest, and 15 percent to the southeast.

Groceries

Groceries arrived by truck at the dealers' facilities from production points, boat piers, or team tracks. Most of the rail receipts arrived at dealers' facilities or at public storage facilities. About 6 percent of the rail volume arrived on team

tracks, necessitating cartage to the dealers' facilities.

Many grocery dealers specialized in selected commodities, and an interchange of commodities was necessary to complete orders. As a result, almost 17 percent of the direct receipts were handled more than once; most of this volume was transferred between markets. The actual volume handled was 627,000 tons.

Groceries distributed to retail outlets or distribution points within the Boston metropolitan area, either by buyers' or sellers' trucks, amounted to 365,000 tons—68 percent of the total receipts. About 20 percent of this volume was distributed to food chains. Distribution outside the metropolitan area accounted for 170,000 tons. Of this tonnage, about 29 percent went to retail outlets or jobbers in the northeast and the Maritime Provinces of Canada. An additional 18 percent was distributed in western Massachusetts. About 19 percent of the groceries distributed outside the area moved to the northwest, 15 percent moved to the southeast, and 19 percent to the southwest.

Meat

Most of the meat arrived by truck and rail directly at dealers' stores. About 40,000 tons of the direct receipts of meat were subject to cartage—6,000 tons that arrived by boat, and 34,000 tons that arrived on team tracks.

Many meat dealers used special cuts of meat because of the nature of their operations. To obtain maximum utilization of a carcass, they sold the remainder to other dealers. This resulted in transfers of 34 percent of the total receipts—more than twice the percentage found in any other commodity group. Over 60 percent of the transfers were between markets. The actual volume handled by independent meat dealers in all markets was 592,000 tons.

Distribution to outlets in the metropolitan area accounted for 45 percent of the meat that moved through Boston market channels. This volume was generally distributed in the sellers' trucks. The largest tonnage was distributed within Boston, because of the large number of restaurants and hotels in the area. The smallest tonnage—about 3 percent of the volume distributed within the metropolitan area—was distributed to local chains. Of the tonnage distributed outside the metropolitan area, almost 60 percent was shipped to the southwest, which included Rhode Island, Connecticut, and New York.

Poultry, Eggs, and Dairy Products

Almost all the poultry, eggs, and dairy products arrived in Boston directly at dealers' facilities because of the large volume received by truck. Rail receipts arrived either at the dealers' facilities or at public cold storage warehouses. About half of the rail receipts arrived at team tracks and were subject to cartage charges.

FLOW OF ALL COMMODITIES THROUGH THE
WHOLESALE FOOD MARKETING FACILITIES
BOSTON, MASS., 1961*

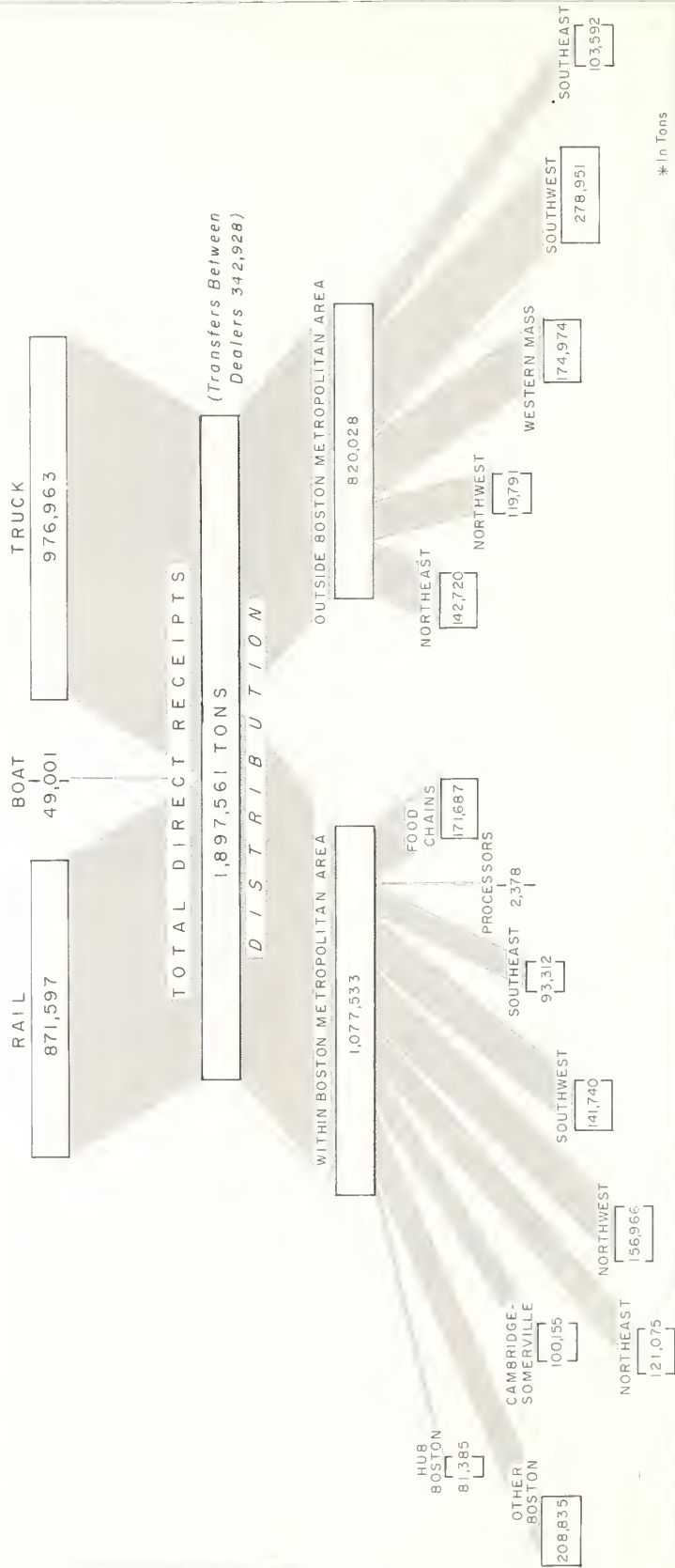


Figure 11

Transfers between poultry, eggs, and dairy product firms were only about 10 percent of the direct receipts. The largest tonnage was handled between dealers in the same market. The direct receipts, plus the interdealer transfers, represent an actual tonnage handled through Boston market channels of about 160,000 tons.

Approximately 70 percent of the volume of poultry, eggs, and dairy products was distributed to outlets within the metropolitan area. Slightly over 29 percent of this volume was distributed in Hub Boston and Other Boston. Of the tonnage distributed outside the metropolitan area, about 54 percent went to western Massachusetts. The next area in importance of receipts from Boston wholesale firms was the southeast, predominantly the south shore area of the State.

Frozen Foods

The 108,000 tons of frozen food received by Boston wholesale frozen food firms arrived directly at dealers' facilities. The perishability of frozen foods, and the strict temperature control required, made it extremely difficult to transfer these items between dealers; therefore, the volume transferred was negligible.

Frozen food dealers distributed approximately 67 percent of their products to retail and institutional outlets in the city. Food chains were the largest receivers of frozen food, with 35 percent of the total in the city. The next largest volume went to Hub Boston, possibly because of the many restaurants in this area. Of the volume distributed outside the metropolitan area, the largest amount went to the southeast, primarily the resort areas on the south shore.

Handling and Other Costs

The handling of food through the Boston wholesale market was in many cases wasteful and inefficient. Some measure of this waste and inefficiency can be seen in a comparison of costs for moving food through the market in its present condition and through the improved facilities that will be described later in this report.

This section of the report presents selected costs in the present wholesale food market for (1) moving commodities from the point of initial receipt in the Boston area to wholesalers' facilities; (2) handling commodities within the market; and (3) distributing them from market. The costs selected are those for the labor, storage, and transportation involved in handling food through the market; they are limited to factors that could be affected by improved facilities. Other factors that are affected by facilities, but that are not readily measurable in terms of costs, are discussed later in the report.

Items of cost for *moving commodities into the market from the point of initial receipt* were cartage and avoidable delay to inbound trucks.

Cartage costs covered the loading of commodities into trucks from rail cars at team tracks and boats at port facilities, transporting commodities to dealers' facilities, and unloading them. In Boston, the cartage was performed by contract haulers or by individual firms using their own trucks.

Avoidable delay was computed as the cost for delays in delivery of truck receipts because of traffic congestion.

Under the general heading *handling commodities within the market*, labor costs were considered for (1) unloading over-the-road trucks or rail cars on house tracks into dealers' facilities or buyers' trucks; (2) unloading rail cars on team tracks into buyers' trucks; (3) transferring commodities between dealers, by motor vehicle or handtruck; (4) handling within dealers' facilities; and (5) loading buyers' trucks from dealers' facilities. Handling within dealers' facilities included moving commodities into and out of storage, selecting orders, and setting up displays, but did not include sales or, usually, processing. Some processing costs, such as breaking, trimming, and grinding, were included in the handling of meat.

Also considered under handling commodities within the market were costs for use of handling equipment, rent for dealers' facilities, demurrage, public warehouse service, and avoidable spoilage to commodities because of inadequate facilities. Costs for heat, light, telephone, management, and office staff were not included.

Distribution of commodities from the market covers costs for handling products, beginning with the time required to pick them up (at dealers' facilities, or from team tracks or over-the-road trucks) until they arrived at a distribution point within the metropolitan area or, if they were for delivery outside the area, to the border of the metropolitan area (State Circumferential Route 128). The costs computed were for ownership and operation of the motor vehicle and for labor costs for the driver and his helper. Any delay time encountered in waiting for trucks to be loaded that was due to traffic congestion was included in these costs.

Details on the methods of computing costs for moving food through the market, and separate costs for the four market areas, are in the appendix.

Fresh Fruits and Vegetables

Total handling and other costs for moving 665,000 tons of fresh fruits and vegetables through the market were \$9,717,000 (table 6).

Costs for moving products from the initial point of receipt in Boston to wholesalers' facilities consisted of cartage for 21,000 tons and avoidable delay to inbound trucks for 110,000 tons. Most of the avoidable delay to trucks occurred at Faneuil Hall market. Cartage and delay costs could be considerably reduced in improved market facilities.

TABLE 6.—*Estimated annual costs of moving fresh fruits and vegetables through Boston wholesale markets, 1961*¹

Cost item	Cost	Volume involved
MOVING COMMODITIES TO DEALERS' FACILITIES		
Cartage from—	1,000 dollars	Tons
Team tracks.....	119. 0	19, 930
Boat piers.....	9. 9	1, 588
Total cartage.....	128. 9	21, 518
Avoidable delay to inbound trucks.....	5. 5	110, 603
Total to dealers' facilities.....	134. 4	665, 022
HANDLING WITHIN THE MARKET ²		
Labor for—		
Unloading rail cars on—		
House tracks into wholesale facilities.....	179. 9	190, 214
Team tracks into buyers' trucks.....	190. 6	150, 643
Unloading trucks into—		
Wholesale facilities.....	233. 2	253, 655
Buyers' trucks.....	50. 2	41, 789
Interdealer transfers ³	541. 5	88, 365
Handling within wholesale facilities.....	2, 157. 6	553, 752
Loading buyers' trucks from sidewalks and stores.....	509. 1	553, 752
Total labor.....	3, 862. 1	753, 387
Other costs:		
Use of handling equipment.....	42. 4	530, 735
Rent for wholesale facilities.....	1, 475. 2	530, 735
Demurrage.....	76. 5	347, 818
Avoidable spoilage.....	509. 8	665, 022
Total other costs.....	2, 103. 9	665, 022
Total labor and other costs within the market.....	5, 966. 0	665, 022
DISTRIBUTING COMMODITIES		
Within Metropolitan Boston.....	3, 067. 0	336, 300
Outside Metropolitan Boston.....	550. 0	328, 722
Total for distributing commodities.....	3, 617. 0	665, 022
Grand total.....	9, 717. 4	665, 022

¹ Based on appendix table 24.

² Does not include costs for unloading 21,518 tons carted from team tracks and boat piers; these costs are included in cartage costs.

³ Includes transport time and unloading at receiver's facility.

Handling within the market, including all transfers of commodities between dealers, amounted to \$6 million. These costs should also be considerably reduced in an improved market. Labor costs for interdealer transfers were 9 percent of the total costs of handling within the market. Figures for

interdealer transfers include loading, transport time, and unloading.

Costs for unloading rail cars at team tracks into buyers' trucks were high because of the time required to select items, particularly from pool cars or cars with mixed grades. Items were often handled twice, which sometimes caused breakage and deterioration. Inadequate protection of commodities from the weather and damage during storage, however, contributed most to the costs for avoidable spoilage.

The unloading of trucks at dealers' facilities was often complicated by traffic congestion. Commodities could not be unloaded directly into facilities, but had to be transported through the street by handtrucks.

Handling within the facilities themselves represented the highest single area of cost for all handling within the market—about 36 percent of the total labor and other costs. Because of inadequate facilities, these costs were 75 percent higher in the Faneuil Hall market than in any of the other markets (fig. 12). Charlestown market, which had facilities adapted to the specific commodities handled, had extremely low handling costs.

Costs for distributing commodities from the markets made up over one-third of the total costs of marketing fresh fruits and vegetables through Boston market channels. The average cost for deliveries within the metropolitan area was \$9.12 per ton.

Groceries

Total handling and other costs for moving groceries through Boston market channels were \$10,470,000 for 535,000 tons (table 7).

Grocery dealers had the largest volume subject to cartage from team tracks and boat piers of all the commodity groups—51,000 tons—because of the large tonnage that arrived through the port of Boston. These boat receipts incurred 78 percent of the total cartage costs. No cost was charged to avoidable delay to inbound trucks delivering to grocery firms because most firms received products during times when traffic was not a problem.

Labor and other costs for handling within the market amounted to \$7 million. A major factor affecting labor costs for unloading, handling within facilities, and loading out was the method of handling commodities—whether pallets could be used for unit loads or whether hand operations were required (fig. 13). Hand operations were usually needed in Faneuil Hall's antiquated buildings; handling was inefficient because of the tonnage that had to be moved to storage above the first floor and also because of the relatively small volume. Buildings with uneven floors were a problem in all Boston market areas; the uneven floors made it impossible to use handling equipment to move and stack merchandise. Poor space utilization, along with occasional purchases of relatively



N-48601

FIGURE 12.—Inadequate space for storage and handling operations results in higher costs of operating in a basement fruit and vegetable unit in the Faneuil Hall Market.

TABLE 7.—*Estimated annual costs of moving groceries through Boston wholesale markets, 1961*¹

Cost item	Cost	Volume involved
MOVING COMMODITIES TO DEALERS' FACILITIES		
Cartage from—	1,000 dollars	Tons
Team tracks	58.5	12,701
Boat piers	205.6	38,092
Total cartage to dealers' facilities	264.1	50,793
HANDLING WITHIN THE MARKET		
Labor for—		
Unloading rail cars from house tracks and trucks from shipping points into wholesale facilities	875.7	349,188
Interdealer transfers from—		
Other dealers	75.5	19,560
Public warehouses	270.9	71,892
Total interdealer transfers	346.4	91,452
Handling within wholesale facilities	2,500.2	491,433
Loading buyers' trucks	929.3	491,433
Total labor	4,651.6	491,433
Other costs:		
Use of handling equipment	98.5	491,433
Rent for wholesale facilities	795.1	491,433
Demurrage	10.8	225,247
Public warehouse service charges	1,515.5	264,432
Total other costs	2,419.9	535,374
Total labor and other costs within the market	7,071.5	535,374
DISTRIBUTING COMMODITIES		
Within Metropolitan Boston	2,943.6	365,050
Outside Metropolitan Boston	190.6	170,324
Total for distributing commodities	3,134.2	535,374
Grand total	10,469.8	535,374

¹ Based on appendix table 25.

large volumes, made use of public warehouse facilities necessary. Public warehouse service charges amounted to \$1.5 million. Labor costs for handling within stores were 35 percent of the cost of handling within the market.

Most of the groceries were distributed within the metropolitan area at a cost of \$2,944,000.

Meat

For the 443,000 tons of meat moving through Boston markets, the total handling and other costs were \$20 million (table 8).

The cost of receiving by piggyback was included in costs of cartage for team track receipts. Team



N-48623

FIGURE 13.—Hand-stacking of groceries was necessary because uneven floors did not permit use of materials-handling equipment.

track shipments received in rail cars were commonly moved to dealers' facilities by contract hauling. In most markets there were occasional avoidable delays in delivery by trucks, but delays were most frequently encountered in the Faneuil Hall market. Cartage and delay costs on direct receipts amounted to \$180,000.

Contract stevedoring crews were used in some markets to unload meat at dealers' facilities; 80 percent of the unloading was done by contract stevedoring in South Boston, but none in Charlestown. Trucks were loaded by wholesalers' employees and the driver and helper on buyers' trucks. Normally, two employees of the wholesaler moved products from the store to the tailgate of an insulated motortruck, and the driver and his helper loaded the truck. Loading costs were 8 percent of the total labor costs for handling within the market.

Handling within dealers' facilities included such operations as assembling of orders, boning, breaking, trimming, grinding, preloading, and general movement of meat within the store. Processing costs such as those involved in changing the chemical nature of the product by cooking, curing, or smoking were excluded. Costs of handling within dealers' facilities were 84 percent of

TABLE 8.—*Estimated annual costs of moving meat and meat products through Boston wholesale markets, 1961*¹

Cost item	Cost	Volume involved
MOVING COMMODITIES TO DEALERS' FACILITIES		
Cartage from—	<i>1,000 dollars</i>	<i>Tons</i>
Team tracks	151.2	34,393
Boat piers	27.2	6,178
Total cartage	178.4	40,571
Avoidable delay to inbound trucks...	1.6	38,908
Total to dealers' facilities	180.0	443,327
HANDLING WITHIN THE MARKET		
Labor for—		
Unloading rail cars on house tracks and trucks from shipping points...	623.0	402,756
Interdealer transfers from—		
Other dealers	492.5	145,631
Public warehouses	15.1	3,425
Total interdealer transfers	507.6	149,056
Handling within wholesale facilities...	11,911.8	587,823
Loading buyers' trucks	1,156.1	587,823
Total labor	14,198.5	587,823
Other costs:		
Use of handling equipment	33.5	587,823
Rent for wholesale facilities	2,999.1	587,823
Demurrage	267.1	220,357
Public warehouse service charges ..	605.3	31,525
Total other costs	3,905.0	443,327
Total labor and other costs within the market	18,103.5	443,327
DISTRIBUTING COMMODITIES		
Within Metropolitan Boston	1,744.6	200,123
Outside Metropolitan Boston	347.4	243,204
Total for distributing commodities	2,092.0	443,327
Grand total	20,375.5	443,327

¹ Based on appendix table 26.

the total labor cost for handling within the market (fig. 14).

Most movement of meat between dealers or between dealers and public warehouses was by motortruck. Within one market, however, transfers between stores were sometimes made by meat rail or handtruck.

The rental cost for meat dealers—almost \$3 million—was high because most facilities were completely refrigerated.

Distribution costs for meat were \$2 million.

Poultry, Eggs, and Dairy Products

Total handling and other costs for poultry, eggs, and dairy products were \$2.5 million for 146,000 tons (table 9).

Direct receipts subject to cartage charges consisted primarily of imported cheese and manufactured dairy products. Poultry received at team tracks was handled by pool car distributors, and dairy products were handled by employees of firms receiving these products. Avoidable delay to inbound trucks was encountered only in the Faneuil Hall market. Total costs for cartage and delay were \$30,000.

Handling poultry, eggs, and dairy products within the market cost \$1.8 million; this repre-

TABLE 9.—*Estimated annual costs of moving poultry, eggs, and dairy products through Boston wholesale markets, 1961*¹

Cost item	Cost	Volume involved
MOVING COMMODITIES TO DEALERS' FACILITIES		
Cartage from—	<i>1,000 dollars</i>	<i>Tons</i>
Team tracks	21.8	8,661
Boat piers	7.3	3,143
Total cartage	29.1	11,804
Avoidable delay to inbound trucks...	1.7	44,684
Total to dealers' facilities	30.8	145,616
HANDLING WITHIN THE MARKET		
Labor for—		
Unloading rail cars from house tracks and trucks from shipping points	120.0	127,123
Other dealers	29.9	12,434
Public warehouses	3.6	1,621
Total interdealer transfers	33.5	14,055
Handling within dealers' facilities...	743.3	152,982
Loading buyers' trucks	206.2	152,982
Total labor	1,103.0	152,982
Other costs:		
Use of handling equipment	7.1	152,982
Rent for wholesale facilities	328.1	152,982
Public warehouse service charges ..	365.5	25,137
Total other costs	700.7	145,616
Total labor and other costs within the market	1,803.7	145,616
DISTRIBUTING COMMODITIES		
Within Metropolitan Boston	644.2	103,086
Outside Metropolitan Boston	40.1	42,530
Total for distributing commodities	684.3	145,616
Grand total	2,518.8	145,616

¹ Based on appendix table 27.



N-48607

FIGURE 14.—Small, inefficient facilities increase costs of operation.

sents about 72 percent of the total costs of handling through the market. Unloading costs per ton for eggs and dairy products were about two-thirds of the unloading cost for poultry. Packages of eggs and dairy products were dry and easy to handle, and generally did not weigh over 50 pounds, whereas boxes of poultry were wet, weighed about 75 pounds when iced, and in general were more awkward to handle. Costs for handling products within dealers' facilities varied substantially among markets and dealers, because of the different commodities or combinations of commodities handled. These costs were 67 percent of the total labor costs for handling within the market. Loading out operations were complicated because of the perishability of the products: orders could rarely be preassembled and most had to be moved directly from coolers.

Public warehouse services were used, particu-

larly before holiday periods, because of the need for extra storage space. Frozen turkeys accounted for 75 percent of the warehouse charges.

The cost of distributing poultry, eggs, and dairy products was \$684,000.

Frozen Foods

The total handling and other costs for moving 108,000 tons of frozen food through Boston market channels were \$2.4 million (table 10). The cartage involved in handling direct receipts was that from local processors, and the cost was \$31,000. Frozen food generally was not received on team tracks because of the strict temperature requirements. The location of frozen food firms was such that avoidable delay was not a factor. Total costs for handling within the market were \$1.7 million and distribution costs were \$667,000.

TABLE 10.—*Estimated annual costs of moving frozen food through Boston wholesale markets, 1961*¹

Cost item	Cost	Volume involved
MOVING COMMODITIES TO DEALERS' FACILITIES	<i>1,000 dollars</i>	<i>Tons</i>
Cartage from Boston processors.....	31. 4	4, 128
Total to dealers' facilities.....	31. 4	108, 222
HANDLING WITHIN THE MARKET		
Labor for—		
Unloading rail cars from house tracks into dealers' facilities.....	65. 7	46, 906
Unloading trucks from shipping points.....	80. 1	57, 188
Handling within wholesale facilities.....	606. 0	108, 222
Loading buyers' trucks.....	151. 5	108, 222
Total labor.....	903. 3	108, 222
Other costs:		
Rent for wholesale facilities.....	815. 4	108, 222
Demurrage.....	6. 3	46, 906
Total other costs.....	821. 7	108, 222
Total labor and other costs within the market.....	1, 725. 0	108, 222
DISTRIBUTING COMMODITIES		
Within Metropolitan Boston.....	618. 4	72, 974
Outside Metropolitan Boston.....	49. 3	35, 248
Total distributing commodities.....	667. 7	108, 222
Grand total.....	2, 424. 1	108, 222

¹ Based on appendix table 28.

Summary of Costs

For the nearly 2 million tons of commodities moving through independent wholesalers in the Boston markets the total of the specified handling costs was \$45.5 million. Figure 15 shows the cost per ton for each commodity by market area. Costs per ton ranged from \$6.43 for fresh fruits and vegetables in Charlestown to \$91.58 for meat and meat products in Faneuil Hall. In part, the difference in these costs was due to the various handling operations required by the individual commodities. However, much of this difference in cost can be attributed to the inadequacies of the different markets.

The highest costs per ton for moving all foods through the market were in Faneuil Hall. Charlestown had the lowest cost per ton for fresh fruits and vegetables, and South Boston had the lowest cost per ton for groceries, meat, and poultry, eggs, and dairy products.

Major Defects in the Wholesale Food Market

The principal defects found in the Boston wholesale food market were as follows: (1) Wholesale facilities were scattered in a number of locations (a split market); (2) stores and other facilities were not adapted to food handling; (3) rail service was inadequate; and (4) there was no overall organization to establish regulations, such as business hours, or to help operators comply with health and other municipal regulations. These defects, all of which affect the cost of handling food through the market, are due largely to the fact that the market grew without guidance or direction. As changes occurred in the production, consumption, and mode of transportation of food, various wholesale and other groups attempted to cope with the changing needs of marketing. The attempts were largely unsuccessful because of local conditions and lack of leadership or support. These defects are costly not only to the buyers and sellers who use the market, but to the city of Boston, the consumers, the growers, and the shippers.

The Split Market

The primary function of a wholesale food market in a city is to serve as a common meeting place for buyers and sellers. The split market in Boston makes it difficult and costly for both buyers and sellers to conduct their business.

The division of facilities in widely separated areas makes it extremely difficult for buyers to compare prices and quality, and costly for them to assemble merchandise. Quite frequently, buyers are unable to acquire all kinds and varieties of the commodities they need in one market area, and they may spend a great deal of time visiting the several market areas. Many buyers said they sometimes left the wholesale markets without certain products because they were unable to locate them within their limited purchasing time. In such cases they were unable to supply consumers with these items through their retail stores.

Because of the split market, wholesale dealers often had to maintain more than one place of business. Maintaining operations in more than one location increased operating costs and resulted in excess cartage costs for a large volume of food commodities. Moreover, dual operations often prevented wholesalers from having full knowledge of the supply and demand for their products. The more complete information buyers and sellers have regarding supply and demand, the more competitive will be the price established, and the more readily will food commodities be moved into market channels. The location of stores on public streets, with intermingling of various types of food and nonfood dealers, was also a serious handicap to handling operations and to the orderly exchange of marketing information.

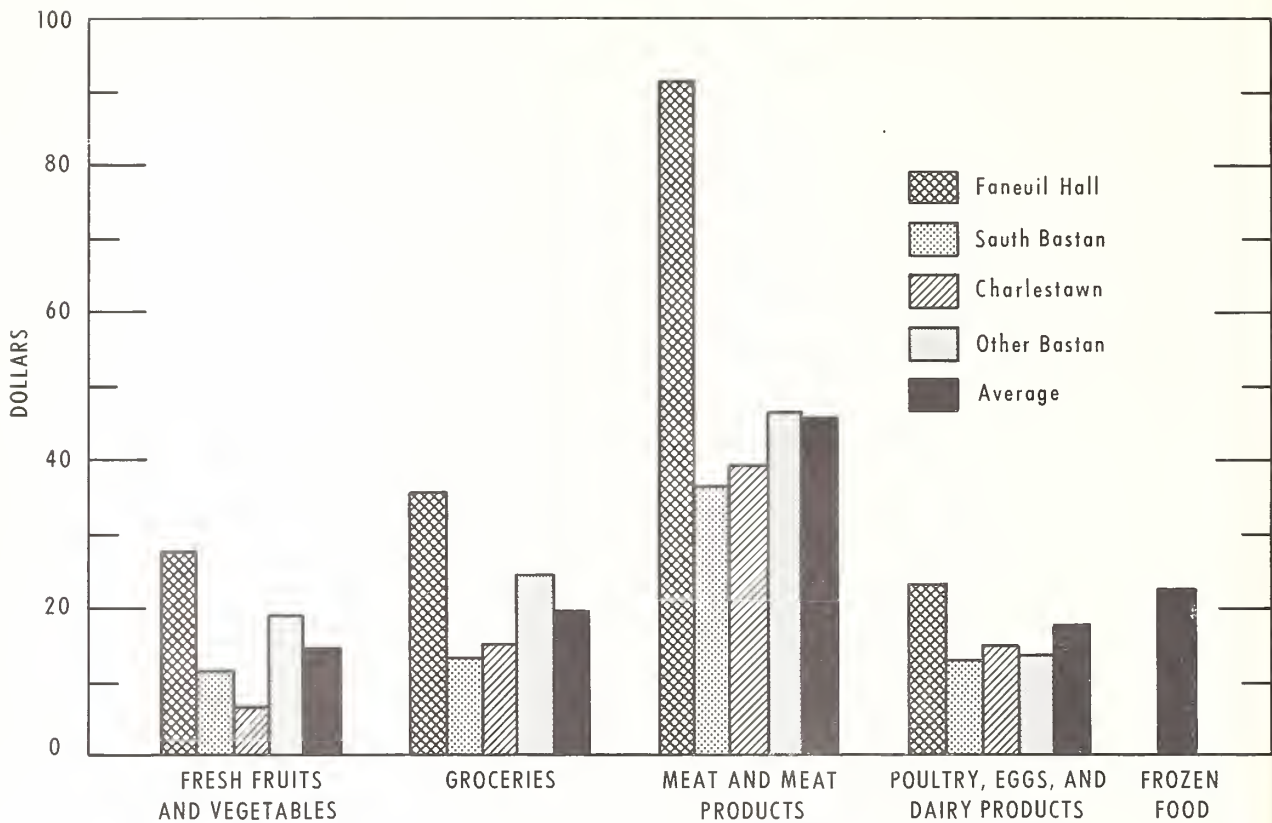


FIGURE 15.—Cost per ton to move food through Boston wholesale markets, 1961.

Facilities Not Adapted to Food Handling

Facilities used by wholesale food dealers were not adequate for food handling operations, with the exception of a few buildings in South Boston, Charlestown, and Other Boston.

Generally, buildings were multistory warehouses, garages, or converted stores not designed for, or capable of being adapted to, modern methods of handling fast-moving food commodities. Few facilities had front and rear platforms of the proper height to facilitate loading and unloading operations with efficient handling equipment (fig. 16). Often a single front entrance was used for both shipping and receiving because rear entrances, if available, were accessible only by narrow alleys.

Many old warehouse buildings with upper levels had slow freight elevators of limited weight capacity, and it was impossible to use modern materials-handling equipment. Dealers were reluctant to use upper levels of such buildings for storage; therefore, first-floor areas were used for storage instead of display. This resulted in extensive use of sidewalks for display, which in turn reduced the efficiency of loading and unloading operations. Trucks had to wait to load or unload, thereby contributing to traffic congestion and parking problems.

Inadequate Rail Service

The lack of direct rail service to their facilities was a major handicap to many dealers. Commodities received on team tracks required cartage and extra handling to move into the dealers' facilities. Such rehandling contributed to losses through spoilage; commodities that were refrigerated in transit lost quality from exposure to the weather after arriving in Boston.

Lack of house tracks also interfered with the effective utilization of labor. If workers were assigned to unloading at team tracks, their labor was lost during travel time, and work at the facility was delayed. Because of this, many dealers had to keep their stores open for long periods to assemble products for the succeeding day. This, of course, added to the cost of doing business. Another effect on business was felt because the extra refrigeration capacity provided for short periods in rail cars on house tracks was not available. Dealers were often forced to sell at distress prices or to use public storage facilities.

Some of these handicaps also affected dealers who had direct but low-capacity rail service to their facilities.

Lack of Regulations

Although individual dealers and others operating in a wholesale food market should have the



N-48611 and N-48619



FIGURE 16.—Lack of space for storage and platforms for loading helped create inefficiencies within the market.

maximum degree of freedom to conduct their businesses, certain activities must be regulated. Lack of regulation of business hours, for example, often creates unnecessary hardships and expense for those operating in the market. Compliance with health and other regulations is also necessary.

In the Boston wholesale food market, sanitary conditions were poor in many facilities, and restrooms were inadequate. Many stores were not rodent- or insect-proof. Basements often were not adequately drained, and they flooded during extremely high tides. Because some facilities were on narrow streets, traffic was slow moving and

often congested. Parking space was inadequate, or regulations were not strictly enforced. Delays because of the congestion and the parking situation often made it necessary for laborers to work overtime loading vehicles that could not gain access to stores during normal working hours. Many businesses had unnecessarily long working hours because of this situation or because competitors remained open for long hours.

Fire insurance rates in many market areas were high, even with strict enforcement of fire codes, because of the narrow congested streets emergency vehicles had to use to reach dealers' facilities.

HOW THE WHOLESALE FOOD MARKET CAN BE IMPROVED

The only possible solution to many of the defects found in the Boston wholesale food market is to build a new food distribution center—a market that is properly laid out and efficiently organized, with buildings and other facilities specifically designed or adapted for the wholesale handling of food. Wholesalers, the tenants of such a market, could anticipate reductions in their operating costs in new facilities designed and arranged for efficient handling of food. The city of Boston, retailers, and consumers could expect to benefit from a modern market where food wholesaling would be concentrated in a single area. Reduced handling could better maintain food quality as well as decrease the cost of moving food through wholesale channels. The new food distribution center should be designed not only to fill present needs but to provide for future requirements of wholesale food marketing in Boston.

This section of the report outlines the points that must be considered in planning and constructing a new wholesale food distribution center for the Boston metropolitan area. The facilities that would be required are described, based on the number of dealers that could be expected to relocate initially and the volume of food they handle. From these data, acreage requirements and a layout of a food center are developed; the layout provides space for expansion of the initial facilities and for addition of new ones. Factors involved in selecting a site for a food distribution center are discussed, and several sites with sufficient acreage are considered. Estimates are made of the initial investment costs for land and the recommended facilities, and methods of financing are described. The revenue required to finance and operate the center is computed and from this figure the average rentals for the new facilities are estimated. The costs of handling food through such a food center are estimated and compared with the costs of handling in present facilities. Savings, where applicable, are indicated. Other benefits that may be derived from a modern food distribution center, that are not measurable in terms of costs, are discussed.

Planning a Food Distribution Center

Some of the most important objectives of a plan for a food distribution center are completeness, adequate facilities, suitable arrangement, proper location, reasonable land cost, and sound management or organization.

A food distribution center must be complete to best serve the public and the food industry. It should accommodate at one location wholesalers and processors of all types of food, so that it is not necessary for a buyer to visit several market areas to obtain a complete line of products. The center should be open to all types of food dealers and their commodities and to all transportation agencies on an equal basis. It should include all independent food operators, chainstore warehouses, and other segments of the food industry. Not all such firms may immediately relocate, but space should be provided for their future relocation.

The buildings must be designed to meet the needs of each type of food handler. Different types of buildings will be required for large- and small-volume handlers of the same food products. The buildings should provide ample space for unloading, display, storage, and sales.

The food processing and wholesaling industry is undergoing rapid changes. Therefore, each type of wholesale unit should be designed so that it can be modified or expanded to meet future demands. These buildings should be of simple design and relatively inexpensive, but constructed to withstand heavy use.

In addition to suitable storage facilities, auxiliary facilities should be available such as house tracks, team tracks, dry storage and refrigerated warehouses, restaurants, public restrooms, and service facilities for motor equipment. Other space is needed for offices, banks, management, inspection service, telegraph service, brokers, barber shops, meeting rooms, and other organizations or industries interested in locating in the market. Adequate parking should be provided for vehicles

or buyers, dealers, and persons employed in the food center. The need for these auxiliary facilities is another reason for placing wholesalers of all types of food in one area.

In developing a wholesale food distribution center, special consideration should be given to arranging the facilities on a given site to facilitate maximum efficiency in the marketing functions. Facilities should be located so that dealers in the same commodity are near each other. This would facilitate transfers between dealers. Firms catering to buyers who pick up supplies in their own trucks should be located in one area so that they can serve their customers without interfering with normal traffic flow. Service facilities, such as dry storage or refrigerated warehouses, should be located strategically to serve the entire market.

Several factors must be taken into consideration in selecting locations for a wholesale food distribution center. Rail connections to the site are a necessity. The market should also be easy to reach from all major highways and have access to major arterial streets of the city. In addition, the food center should be near the center of retail distribution, to reduce the time required for local buyers to make purchases and to minimize distribution costs. Since these factors are important to each type of wholesaler, consideration of them tends to place wholesalers of various types in one area.

In the development of a food center, sufficient land should be acquired at the time of initial purchase. Certainly, the advantages of higher priced downtown land must be weighed against cheaper suburban or rural land; high rentals required to amortize the investment might offset possible savings.

When appraising the cost of land for a market, special consideration should be given to items such as acquisition cost, removal of buildings on the site, placing the land in condition for construction, and cost of piling. It is essential that additional land be allocated for expansion of the facilities initially built as well as for the eventual relocation of food wholesalers and members of allied industries who do not immediately move into the new center.

One of the major problems of operating a food distribution center is that of control and regulation of the market. The proposed market cannot be operated properly without sound management to establish and enforce rules. The market management should endeavor to operate the market at a minimum of cost, without discrimination against any type of dealer or buyer, any form of transportation, or products from any location. Charges levied on the industry for use of the facilities should include costs of operating and maintaining the center. Many costs that will be reflected in rentals can be lower in a food distribution center containing facilities for many firms than in smaller developments, because of the abil-

ity to spread some charges over a large number of operators. Dealers should be allowed the maximum degree of individual initiative within the framework of good business practices for the entire market. However, the market management should be strong enough to assist the industry in enforcing health, traffic, and policing regulations.

In order that the proposed wholesale food center may operate properly, its board of directors or other managing agency should have an interest in the financial success of the center as a whole, as well as an interest in the welfare of shippers, dealers, consumers, transportation agencies, and the appropriate government agencies.

Kind and Amount of Facilities and Acreage Needed

The facilities recommended in this report are based upon the volume of food handled by wholesale dealers who would benefit by moving to new facilities or who will be required to move because of urban renewal projects. *The actual number of facilities constructed should be based upon space needed for the volume handled by responsible tenants who actually sign firm leases.* This precaution is necessary to prevent overbuilding and to insure occupancy of all facilities.

Some independent wholesale firms have new or modern facilities and would not benefit from moving. Facilities are not planned for these firms nor for wholesalers who operate partly as retailers and would lose their retail business if they moved.

Two types of buildings are needed for dealers locating in the new food distribution center: Multiple-occupancy buildings to accommodate small-volume dealers and single-occupancy buildings for large-volume dealers. Single-occupancy buildings are recommended when the needs of a firm exceed 15,000 square feet of first floor space.

Multiple-occupancy buildings consist of rows of individual units with a single-story operating area and either a second floor or mezzanine. The units may vary in width; generally they are 100 feet in depth. This type of building combines the advantages of low construction cost with the high versatility required for handling fast-moving food commodities. Such structures provide convenience for interdealer transfers and for buyers who shop the market. Space recommendations have been based upon volume rather than the number of dealers who can be expected to relocate, in the event fewer firms are handling the volume at the time of construction or at some future date. For this reason, and to allow for future expansion, temporary or removable partitions are recommended between units of the multiple-occupancy buildings. Recommendations for certain design details of multiple-occupancy buildings and layouts of store units are given in the sections on commodity groups that follow.

TABLE 11.—*Number of dealers expected to relocate in a new food distribution center in Boston, their volume of business, and buildings recommended*

Commodity group or type of business	Dealers	Volume of of business	Multiple- occupancy buildings	Single- occupancy buildings
	<i>Number</i>	<i>Tons</i>	<i>Units</i>	<i>Number</i>
Fresh fruits and vegetables.....	139	595, 340	¹ 70	11
Groceries.....	32	163, 036	¹ 46	10
Meat and meat products.....	96	81, 482	78	4
Poultry, eggs, and dairy products.....	29	68, 530	24	0
Refrigerated, dry storage, and chainstore warehouses.....		(²)	0	5
Total.....	303	908, 388	218	30

¹ Includes one unit for use as a restaurant.

² Figures on volume not available.

Firms performing a highly specialized business and those handling extremely large volumes usually require single-occupancy buildings. The design of single-occupancy buildings should be at the discretion of the firms occupying such space; however, the buildings should conform to the master plan for the market.

A total of 303 independent wholesale dealers, or about 55 percent of all dealers, are included in plans for a new food distribution center. These wholesale firms handled about 908,000 tons of the commodities studied. Table 11 shows the number of dealers, volume of business, and number and type of buildings recommended for each commodity group. Also included in the plans are buildings for two dry storage warehouses, two chainstore warehouses, and one refrigerated warehouse, which would include space for frozen food dealers. These firms were included because their facilities were inadequate or because they were located in a redevelopment area. Their tonnage is not included in the above figure.

The master plan includes 218 store units in 11 multiple-occupancy buildings and 30 single-occupancy buildings. In addition, the new market should include the following in its initial construction:

- (1) Double rail tracks behind buildings to provide a capacity of 500 rail cars.
- (2) Team tracks for 128 rail cars.
- (3) Two restaurants and public restrooms.
- (4) 66 offices for market management, brokers, and allied service industries. (These offices are located on the second floor of a multiple-occupancy building.)
- (5) A restaurant-meeting hall with 220-seat capacity, plus kitchen and storage facilities, located adjacent to the offices.
- (6) Paved streets, not less than 200 feet wide where multiple-occupancy buildings face each other, and service or cross streets at least 65 feet wide.
- (7) Parking areas for 2,300 cars and trucks.

(8) Fencing 8 feet high and gates to enclose the market area.

(9) An area for expansion and for allied industries, to permit construction of additional buildings and service facilities as required.

The specific requirements for each food commodity group are discussed in the following sections.

Fresh Fruits and Vegetables

An analysis of the operations of fresh fruit and vegetable firms indicated that of the 187 dealers, 139 would benefit by moving to new facilities. The remaining dealers had facilities adequate for their present operations or could not economically relocate.

Proposed facilities are 4 multiple-occupancy buildings with a total of 70 units (with one unit as a restaurant), 11 single-occupancy buildings, and team tracks with a capacity for 128 rail cars. Two of the multiple-occupancy buildings contain 22 units each and the other two contain 13.

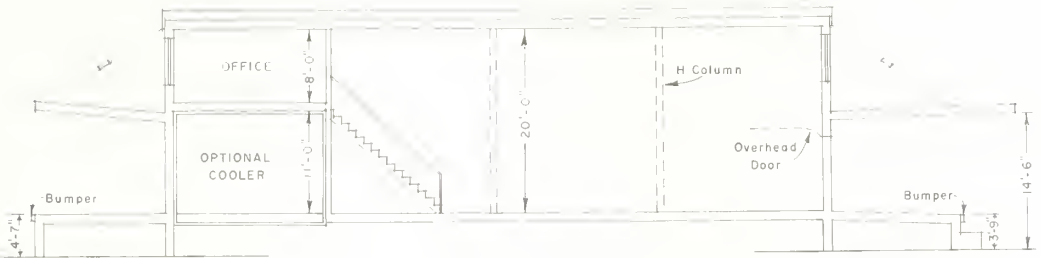
A layout of a proposed unit in a multiple-occupancy building and the general design of the buildings may be seen in figure 17.

Each unit in the multiple-occupancy buildings is 25 feet wide and 72 feet deep and has a ceiling height of 20 feet. It has a mezzanine 17 feet deep by 25 feet wide at the rear of the store. Covered front and rear platforms, each 14 feet deep, make the overall depth of the building 100 feet. Each unit contains 1,800 square feet of enclosed first floor space, 425 square feet of mezzanine space, and 700 square feet of platform space, a total of 2,925 square feet per unit.

The platforms should be continuous the length of the building. The front platform should be at truckbed height, 45 inches above the street, and the rear platform should be 55 inches above the top of the rails, at refrigerator car floor level. The roof over the front platform should extend 6 feet beyond the platform to provide weather protection during loading and unloading operations. The roof should be constructed to provide clear load-



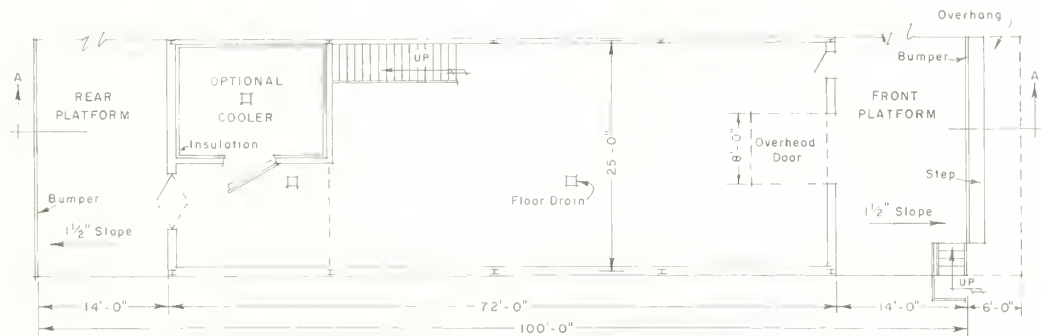
PERSPECTIVE



SECTION A-A



MEZZANINE PLAN



FIRST FLOOR PLAN

END UNIT

FIGURE 17.—Suggested layout for a fresh fruit and vegetable unit at the end of a multiple-occupancy building.

ing areas. A continuous step along the front platform, about half the height of the platform and 24 inches wide, would accommodate small trucks. The front platform should have steps about every fourth unit to facilitate pedestrian traffic. A bumper should be attached to the top of the front and rear platforms to protect them from damage by trucks.

The front entrance should have an 8-foot-wide overhead door and a door for pedestrians at one side of it. The rear entrance should have two 3-foot-wide double-acting doors.

The mezzanine could be used for offices and rest-room facilities, and the area under the mezzanine could be used for a walk-in cooler. Stairs to the mezzanine should occupy a minimum of floor space.

To allow for possible expansion, temporary waterproof partitions should separate the units of each firm from those adjacent to it.

Since individual refrigeration requirements vary, coolers and freezers are not included in these units.⁴ However, floor installation for proposed refrigerated areas should be provided during initial construction phases.

All floors and platforms on the first floor level should have a nonskid surface. The floors should slope to adequate drains and the platforms should slope toward the street.

The interiors should be well lighted. Sufficient electrical outlets should be provided to permit use of special appliances and equipment. Heat could be provided by blower-type heaters. A central control panel for all utilities could be located at one end of the unit.

Rails should be set in the pavement to permit access to the rear platform by trucks. Double tracks would furnish extra capacity during peak periods, and products could be unloaded directly from rail cars into trucks as well as into the stores.

One of the multiple-occupancy buildings would include a second floor above a portion of the store units; this space would provide adequate space for 66 offices. These offices could be used for the market manager, brokers, shippers, agents, transportation representatives, banks, a communication center, and other types of operations. A public restaurant-meeting room for use by trade organizations or other groups could also be located on the second floor.

Some fresh fruit and vegetable firms, including the fruit auction now located in South Boston, would require single-occupancy buildings, because of the size or nature of their operations. An allowance has been made for seven buildings that are 100 by 250 feet, two that are 200 by 225 feet, one that is 200 by 250 feet, and one for the auction that is 100 by 200 feet. These single-occupancy buildings should be designed by the firms that will occupy them. However, these structures should conform to the master plan for the market and to State and local building codes. Details of interior layout of these buildings would be at the discretion of the tenants. All single-occupancy buildings should be served by double rail tracks at the rear and should have adequate parking areas.

The food center would provide 201,825 square feet in multiple-occupancy buildings, and 335,000 square feet in single-occupancy buildings for fresh fruit and vegetable dealers. In addition, there would be 15,750 square feet for offices and 7,000 square feet for a restaurant-meeting room on the second floor of a multiple-occupancy building.

⁴A cooler with inside dimensions of 12 by 16 by 10½ feet, with 4-inch insulation and refrigeration equipment, would cost approximately \$4,000. This estimate does not include necessary masonry work. The refrigeration equipment could go under the rear platform. This cooler would have a capacity in excess of one carload of fruits and vegetables.

The comparable total space used in handling fresh fruits and vegetables in the present Boston markets is 677,000 square feet, but much of this space is ineffectively used because of design and characteristics of the facilities.

Groceries

The 39 grocery wholesalers and specialty handlers whose operations should be relocated would require 45 units in 3 multiple-occupancy buildings and 10 single-occupancy buildings. An additional unit in the multiple-occupancy buildings would be used as a restaurant.

Each unit in the multiple-occupancy buildings is 30 feet wide and 86 feet deep and has a ceiling height of 20 feet. It has a mezzanine 17 feet by 30 feet wide at the front of the store unit. A covered rear platform, 14 feet deep, provides an overall depth of 100 feet. Each unit contains 2,580 square feet of first floor enclosed space, 510 square feet of mezzanine space, and 420 square feet of platform space, a total of 3,510 square feet per unit. A layout of a proposed unit in a multiple-occupancy building and the perspective drawing of the building may be seen in figure 18.

The mezzanine could be used for offices. The area under the mezzanine would be used for handling products received and delivered by truck; it could also be used as an assembly area, where merchandise would be held until it was moved to storage or loaded on outgoing trucks. There should be two truck-loading doors each 7½ feet wide at the front of each unit. The floors at these doors would be 45 inches above the ground. A bumper should be attached below the door openings, to prevent damage to the building by trucks. For truckbeds lower than 45 inches, bridge plates could be used. A 6-foot canopy should be provided over the front loading area for protection from the weather during loading and unloading operations. A 3-foot-wide door beside the truck-loading doors would open on stairs leading to the mezzanine; a door beside the stairs would lead to the area under the mezzanine.

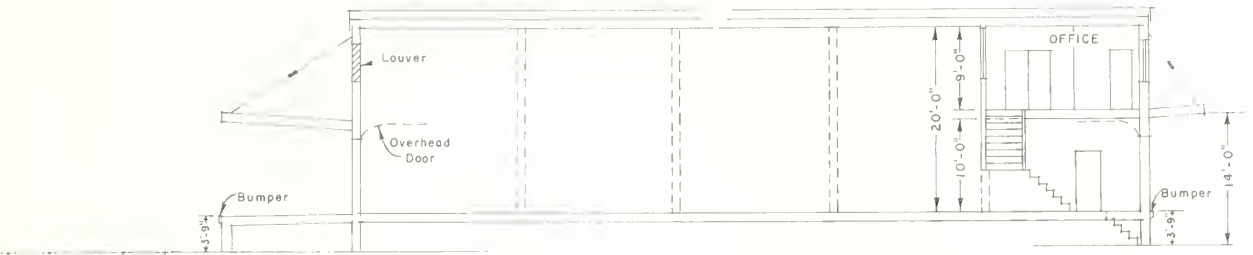
Removable partitions between the units allow for possible expansion of individual units. These units have been designed to provide expansion with a minimum of column interference.

The floor surfaces should be of nonskid, dust-proof concrete and should slope to drains. Warehouse lights should be placed directly over the aisles for more efficient and more accurate selection. Heat could be provided by infrared gas heating or gas or electric heaters, depending upon the choice of the tenant. A central control panel for utilities should be provided at one end of the unit.

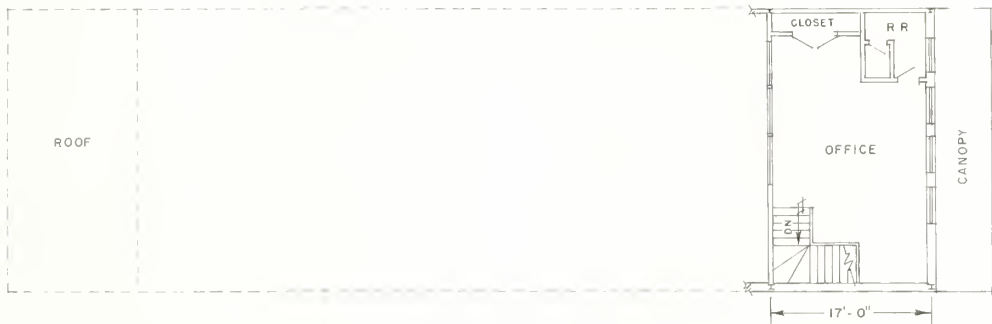
Rails should be set in the pavement to permit access to the rear platform by trucks. Double tracks would furnish extra capacity, and products could be loaded directly from the tracks to trucks.



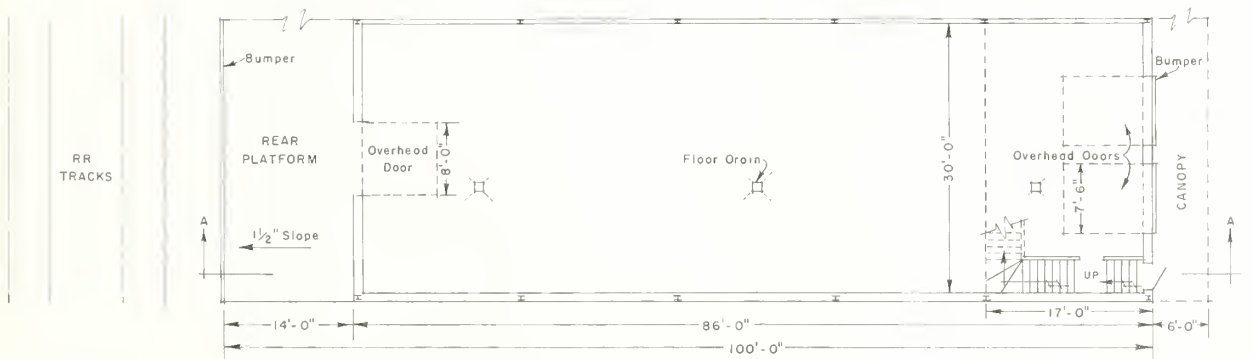
PERSPECTIVE



SECTION A-A



MEZZANINE PLAN



FIRST FLOOR PLAN
END UNIT

FIGURE 18.—Suggested layout for a grocery unit at the end of a multiple-occupancy building.

Space allowed for single-occupancy buildings for large-volume grocery firms consists of three buildings 100 by 150 feet, and one each: 100 by 200, 100 by 240, 150 by 200, 200 by 200, 200 by 225, 200 by 250, and 200 by 325 feet. Design of these buildings would be at the discretion of the firms that occupy them. Efficient layouts for wholesale grocery firms are described in a report by Bouma and Lundquist.⁵

The buildings should conform to all building codes, health and sanitary requirements, and the master plan for the market.

The grocery wholesalers and specialty handlers in the multiple-occupancy buildings have a total first floor area of 135,000 square feet and 22,950 square feet in mezzanines. Total first floor area for firms in single-occupancy buildings is 319,000 square feet. The grocery firms that will relocate presently occupy 1,098,000 square feet. In the new facilities, because of improved operating conditions, they will require 476,000 square feet.

Meat

The facilities proposed for the 96 meat and meat products dealers include 78 units in 3 multiple-occupancy buildings and 4 single-occupancy buildings.

Each multiple-occupancy meat unit should be 25 feet wide and 100 feet deep, including front and rear platforms. Since the entire first floor of the unit is refrigerated, a second floor should be provided to include space for offices, welfare rooms, dry storage, and the refrigeration equipment. The total ceiling height of the unit should be 20 feet, which provides 12 feet for the first floor and 7 feet for the second floor.

Each store unit of the dimensions suggested for the meat and meat products firms would contain 2,500 square feet of first floor space, 1,800 square feet of second floor space, a total of 4,300 square feet. A proposed layout of an individual end unit and the general design of the multiple-occupancy building may be seen in figure 19.

Two platforms, each 14 feet deep, should extend the length of the multiple-occupancy building. The front platform should be 45 inches above the street for truck loading and unloading, and the rear platform should be 55 inches above the railroad tracks for unloading refrigerator cars. The platforms should be sloped to provide adequate drainage, and the front platform should be covered by an overhang to provide all-weather protection during loading and unloading operations. Bumpers should be placed along the edge of both platforms and there should be steps for pedestrians on the front platform. Each of the platforms should be equipped with two meat rails that extend the length of the multiple-occupancy building.

The rails should be at least 7½ feet from the floor, and switches should be installed at each store unit. These rails would permit loading and unloading at any point on the platform and provide an efficient means for transfers of meat between dealers.

Partitions between units should be made of materials that are easily removed to provide for possible future expansion. Store interiors should be well lighted. There should be a central control panel for all utilities including lighting. Provision should be made for additional lighting fixtures and electrical outlets.

Floors should be constructed either of vitrified brick of good quality, bonded with acid-resistant, waterproof mortar, and laid on a waterproof base, or of dense, acid-resistant, waterproof concrete. All floors should slope to drains, particularly where large amounts of water might accumulate.

The first floor of the unit should be insulated. The refrigeration equipment should be sufficient to supply temperatures of 0° F. for freezers, 32° to 34° for coolers, and 34° to 50° for work areas. Refrigeration distribution systems should be suspended from ceilings to keep the floor areas clear. Meat rails should be provided for all multiple-occupancy units. Meat rail systems may be supported from the floor or suspended from the ceiling of the coolers.

An enclosed stairway, leading to the second floor interoffice corridor, could be built at each end of the multiple-occupancy buildings to reduce traffic in the first floor area.

A hot water system in each unit should be capable of providing an adequate supply of water at a temperature of 180° F. for both welfare and cleanup. Firms requiring steam could supply their own needs.

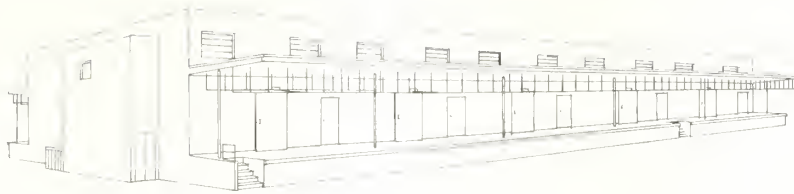
Railroad tracks at the rear of each facility also could serve as team tracks for meat loaded directly into buyers' trucks. Track areas should be paved to permit use by trucks.

The four single-occupancy meat buildings should be served by railroad tracks and should have front and rear platforms. It may not be necessary for the platforms to extend the length of the building, as in the plan for multiple-occupancy buildings. Refrigeration equipment, insulation, and meat rails should be installed at the expense of the tenants. Long-term leases should be required for this type of structure because meat rails, refrigeration equipment, and insulation are included in the original design.

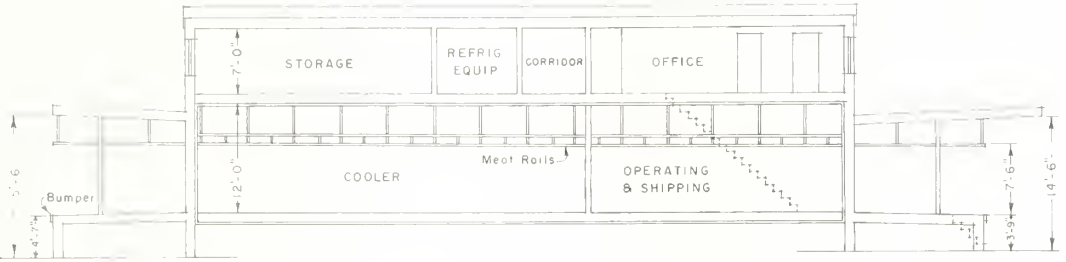
Area for one-story single-occupancy buildings includes one building with 10,000 square feet, two with 30,000 square feet each, and one with 40,000 square feet.

The completed food center would provide 305,000 square feet of first floor space for 96 dealers, and 140,400 square feet of second floor space, a total of 445,400 square feet. In their present facilities these firms occupy 1,193,000 square feet of space.

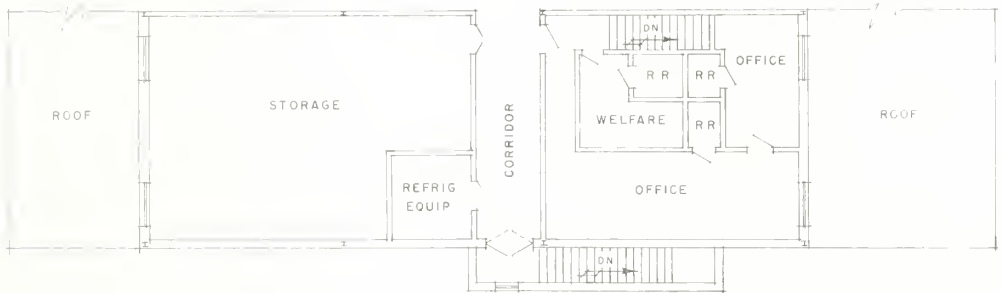
⁵ Bouma, John C., and Lundquist, Arnold L. GROCERY WAREHOUSE LAYOUT AND EQUIPMENT FOR MAXIMUM PRODUCTIVITY. U.S. Dept. Agr. Mktg. Res. Rpt. No. 348, 58 pp., illus. 1959.



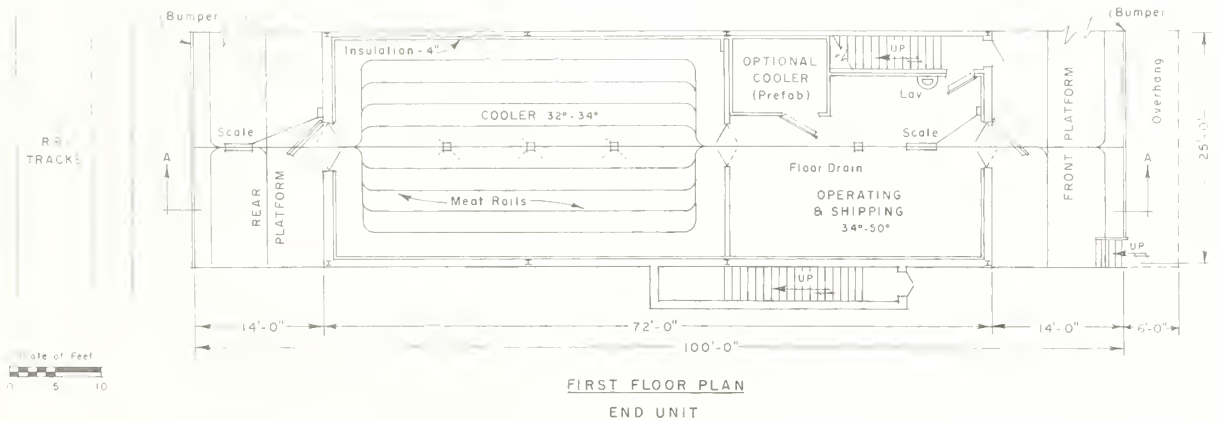
PERSPECTIVE



SECTION A-A



SECOND FLOOR PLAN



FIRST FLOOR PLAN
END UNIT

FIGURE 19.—Suggested layout for a meat unit at the end of a multiple-occupancy building.

Poultry, Eggs, and Dairy Products

The 29 dealers in poultry, eggs, and dairy products would require 24 units in 3 multiple-occupancy buildings. Each store unit would be 30 feet wide, 72 feet deep, with a 20-foot ceiling height. Covered front and rear platforms, each 14 feet deep, would provide an overall depth of 100 feet.

Store units for poultry and for eggs should have an unfinished second floor; units for dairy products are provided with mezzanines. Second floors are recommended for firms dealing in poultry and eggs to provide storage space for cartons and boxes used in packing operations. The space could also be used for welfare rooms and refrigeration equipment.

Each of the 16 store units for poultry and egg firms contains 2,160 square feet of enclosed first floor space, 2,160 square feet of second floor space, and 840 square feet of platform space, for a total of 5,160 square feet. The 8 units for butter and cheese firms, with mezzanine (510 square feet) instead of second floors, have a total of 3,510 square feet each.

Figures 20 and 21 show suggested interior layouts for poultry and egg facilities and the general design of the multiple-occupancy building. Figure 22 shows a layout for a firm dealing in dairy products.

Front and rear platforms should extend the length of the multiple-occupancy buildings. The front platform should be at truckbed height, 45 inches; the rear platform should be 55 inches high, at refrigerator car floor height. A bumper strip should be bolted to the edge of the front and rear platforms to protect them from damage by trucks. The roof over the front platform should extend 6 feet beyond the platform to provide protection during inclement weather. The roof should be suspended to provide clear loading areas.

Since individual firms may wish to lease two or more units, removable partitions with as few columns as consistent with good construction practices should be used. All floors and platforms should have a nonskid concrete surface. The floors should slope to drains, and platforms should slope toward the street. Utility controls could be centrally located on a control panel. Heat could be furnished by oil, gas, or electric space heaters. Because refrigeration requirements for these dealers vary, choice and installation of refrigeration should be left to the discretion of the dealer.

Rail tracks at the rear of these facilities should be embedded in the pavement to permit access by trucks.

Total floor space for the poultry, eggs, and dairy product firms relocating would be 105,000 square feet. In their present facilities these firms occupy 185,000 square feet.

Refrigerated Warehouse

Certain frozen food dealers indicated an interest in a wholesale food distribution center, but there are not enough dealers with sufficient volume for a multiple-occupancy building devoted to frozen food. One of the major cold storage companies, however, has a warehouse in the downtown waterfront redevelopment area. If this company were to relocate this warehouse in the food distribution center, space could be provided in the warehouse for frozen food dealers.

These frozen food dealers would require about 30,000 square feet. Data provided by the refrigerated warehouse company indicated that a refrigerated storage capacity of 60,000 square feet would be required. Allowance has been made in the plan for a refrigerated building 200 by 450 feet.

Other Facilities

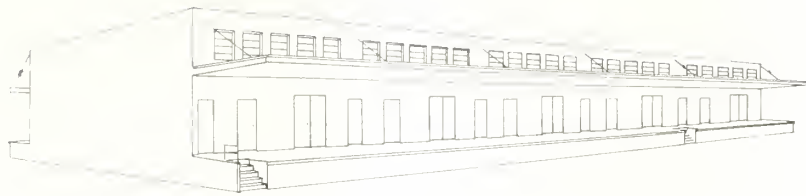
Analysis of the requirements of the food industry in Boston show that certain other facilities, including two dry storage buildings and two chainstore warehouses, would be necessary for the proposed center. The dry storage buildings would replace warehouses used extensively by food firms in the downtown waterfront redevelopment area. Space has been allocated for two dry storage buildings, each containing 85,000 square feet and two chainstore warehouses, one containing 200,000 square feet and one containing 40,000 square feet. These buildings would be an integral part of the food distribution center and should be constructed to the requirements of the tenants.

The food distribution center should also have two restaurants and public restroom facilities. Two units in multiple-occupancy buildings have been allocated for this use; actual location and design of these facilities would depend on final plans for the center.

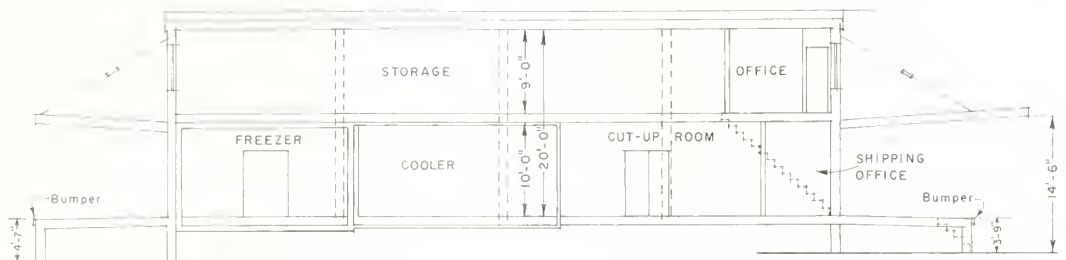
Streets and Parking Areas

All major streets in the food center should be paved to carry heavy traffic and to facilitate drainage away from the buildings. When buildings face each other, streets should be at least 200 feet wide to provide normal traffic flow when semitrailers are backed up to the building platforms. Streets behind the buildings should be at least 150 feet wide, if parking or truck unloading is permitted at the rear of the buildings. Cross streets, at least 65 feet wide, should be provided to facilitate normal traffic flow and permit efficient access to various sections of the market.

Parking areas should be convenient to buildings, but should not block the streets or loading and unloading areas. Some parking areas should be designated for parking for over-the-road trucks only; others for automobiles and small trucks. Parking at platforms should be at a 90-degree angle. Land reserved for expansion should not



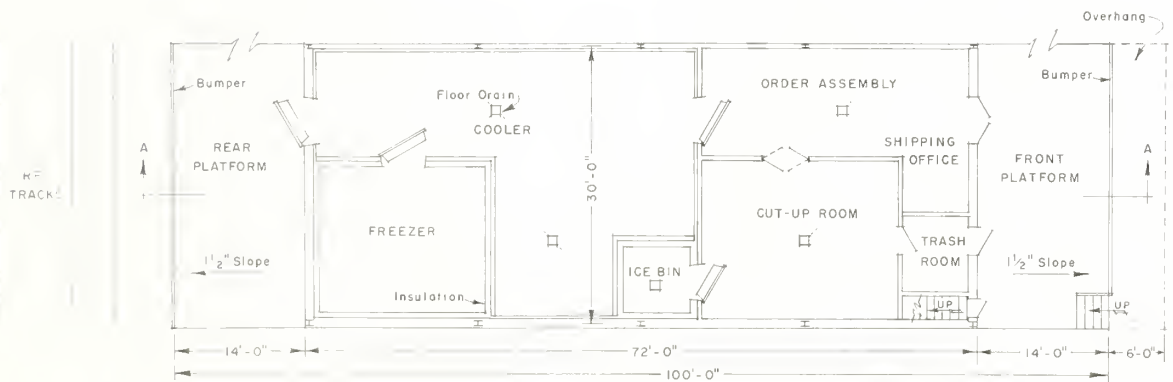
PERSPECTIVE



SECTION A-A



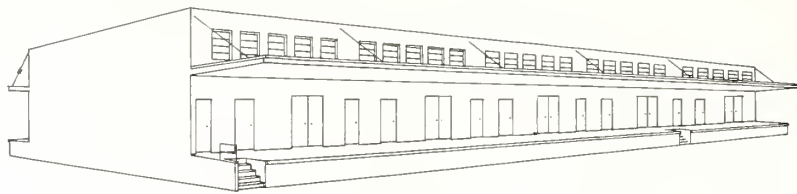
SECOND FLOOR PLAN



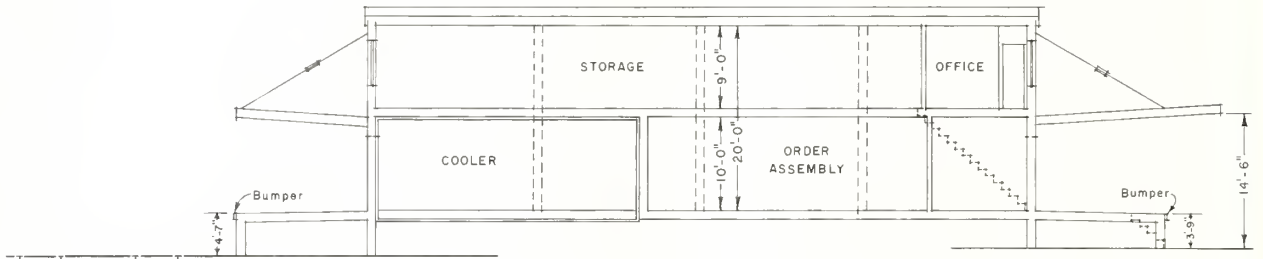
FIRST FLOOR PLAN

END UNIT

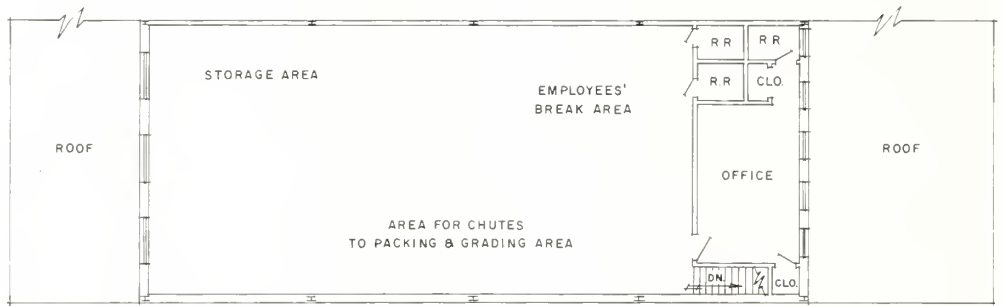
FIGURE 20.—Suggested layout for a poultry unit at the end of a multiple-occupancy building.



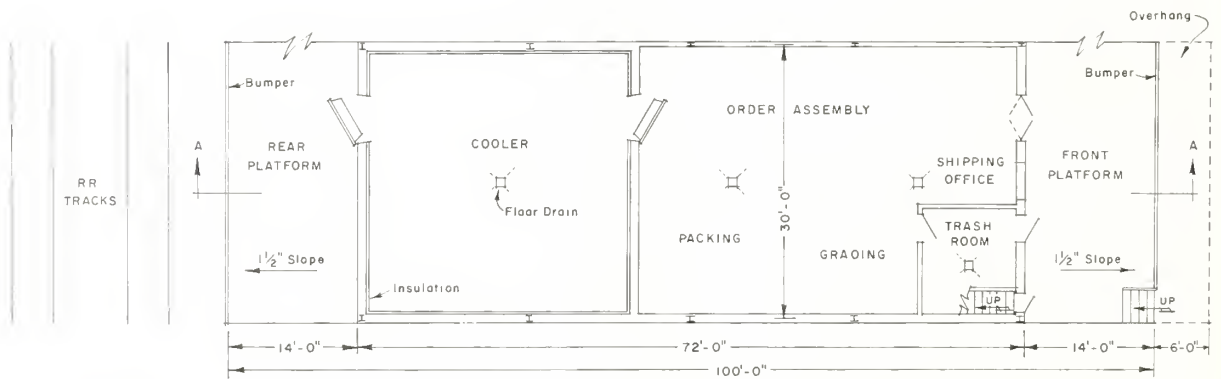
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SECTION A-A



SECOND FLOOR PLAN



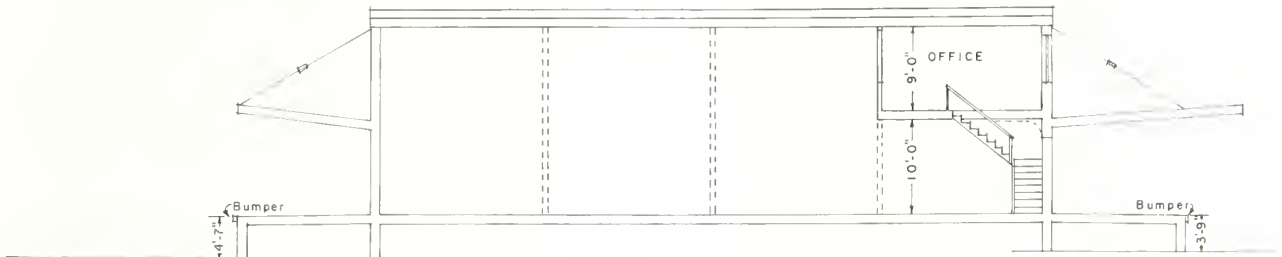
FIRST FLOOR PLAN
END UNIT



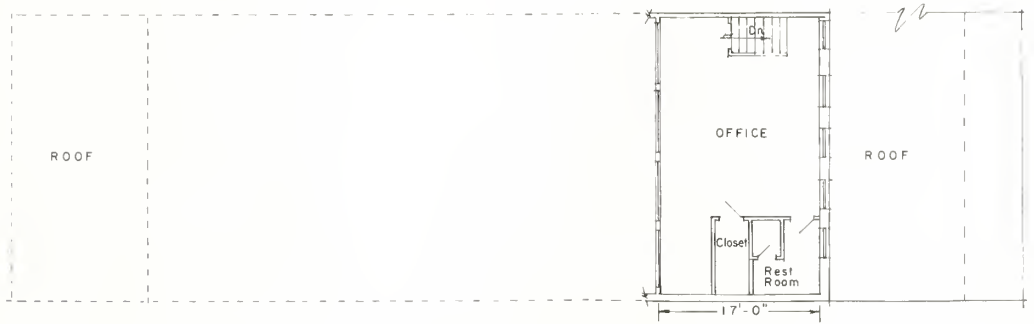
FIGURE 21.—Suggested layout for an egg packing and grading unit at the end of a multiple-occupancy building.



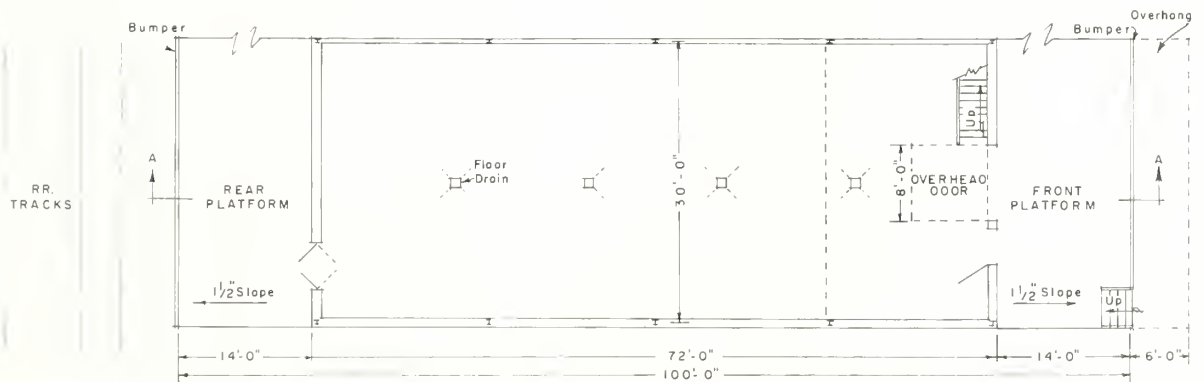
PERSPECTIVE



SECTION A-A



MEZZANINE PLAN



Scale of Feet
0 5 10

FIGURE 22.—Suggested layout for a dairy products unit at the end of a multiple-occupancy building.

be considered to meet the parking requirement, because parking is a permanent need.

Rail Service

Direct rail connections should be provided to each store building. Double tracks are recommended at the rear of the buildings; the track nearest the building would serve as a house track, and the outer track could be used for switching or unloading into buildings or trucks. The second track could function as a team track and direct sales could be made from cars located on it.

Railroad tracks at the rear platform do not preclude the use of the rear platform for unloading trucks. For this reason, and so that the area may be more easily cleaned, the streets at the rear of the stores should be paved between and level with the top of the rails.

Team tracks with a capacity for 128 cars should be sufficient to handle the needs of fresh fruit and vegetable firms and dealers in other commodities.

Total Acreage Needed

All buildings in the food distribution center should have space for expansion, particularly the single-occupancy buildings. Adequate land should be available so that the problems caused by lack of space in the present market areas do not reoccur in the near future. Streets should be of sufficient width to handle market-generated traffic, and parking areas should include space for expansion so that it is not necessary to encroach upon expansion area set aside for buildings. Sufficient space should be provided to meet railroad requirements for house tracks, team tracks, and lead-in tracks. The food distribution center, with the buildings recommended and the necessary facilities to serve it, would require 171 acres.

Many food firms that were not considered for the food center at this time may eventually relocate. In addition, other firms in industries allied to food handling might wish to locate on a food distribution center. For these reasons, an additional 75 acres should be acquired at the time of initial purchase of a site. This would bring the total land required to 246 acres. Firms locating in the area set aside for other industries should be limited to those whose business is compatible with the food handling industry.

Arrangement of Facilities in the Food Distribution Center

The arrangement of the buildings and other facilities in a food distribution center will depend upon the physical features of the site selected. The location of existing and proposed traffic arteries and access by rail are important factors to be considered. *It is most important that a master plan be adopted at the outset so that orderly construction of facilities may be maintained.* If

sufficient land is acquired initially, the site could be developed as an industrial park for food processing and distribution.

Figure 23 illustrates a good arrangement of the facilities recommended. The facilities are grouped on 171 acres, and 75 acres is provided for allied industries or for expansion. Although the site selected for a food distribution center may be of a different shape from the one shown here, the principles illustrated in this layout should be adhered to as closely as possible in developing it. As an example of the type of changes that can be made, the number of multiple-occupancy buildings may vary with the site.

The facilities are grouped by commodity in this master plan, with multiple-occupancy buildings arranged in rows at one end and single-occupancy buildings at the end near the space for expansion. The grouping of facilities by commodity permits each commodity group to maintain efficient operations within its own section and within the framework of the entire market.

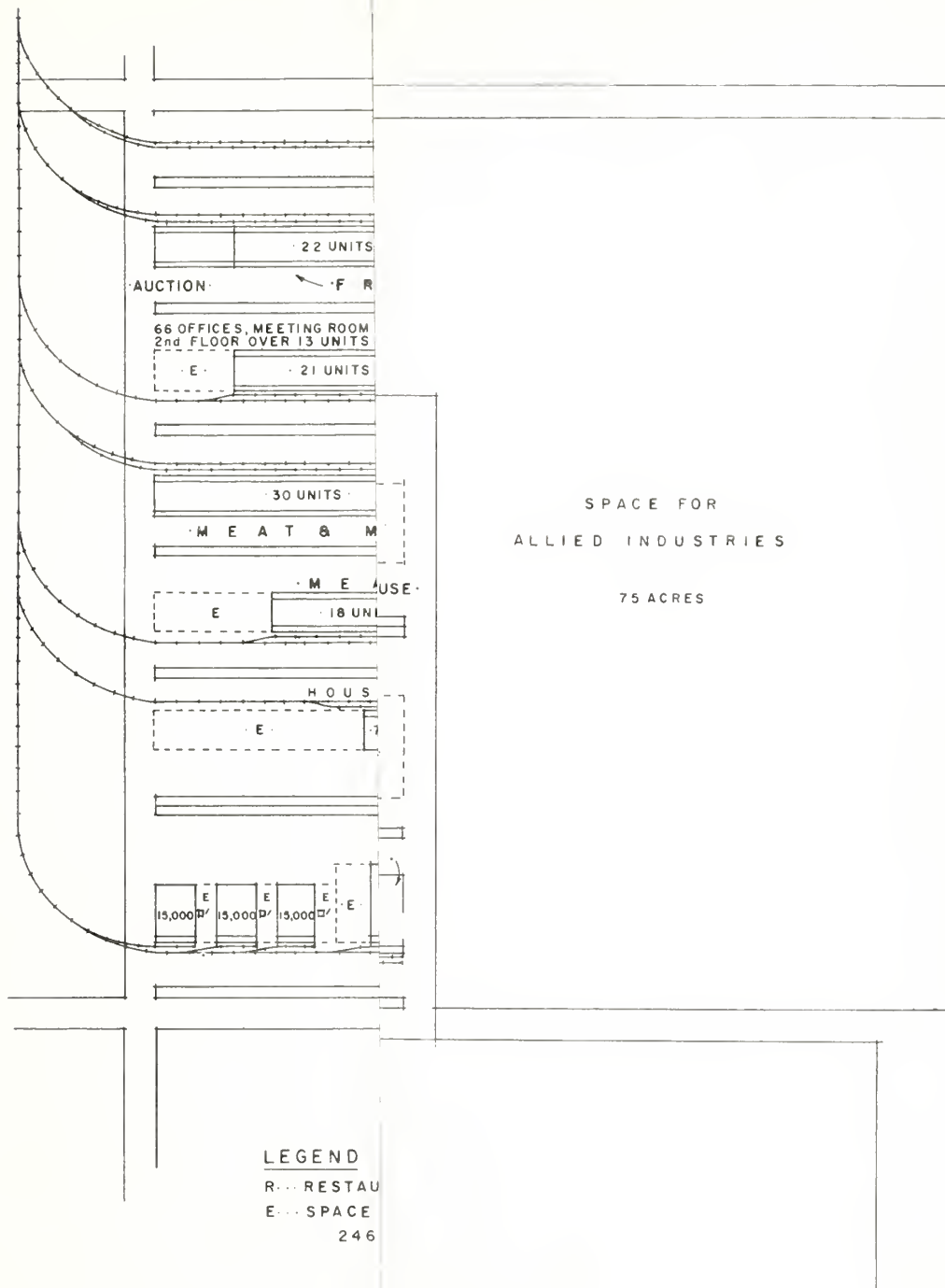
Multiple-occupancy buildings are placed in one section because dealers occupying these facilities cater to buyers who shop the market. Buyers can easily visit stores in one commodity group, load their trucks, and move on to the next commodity grouping. Also, dealers in the same commodity can readily make transfer of products when necessary.

The single-occupancy buildings are located so that they are within their commodity group but away from the heavy traffic surrounding multiple-occupancy buildings. Single-occupancy buildings generally will be used by high-volume service wholesalers or by processors who do not cater to the shopper. These buildings are located near cross streets to permit rapid ingress and egress.

The refrigerated warehouse is located so that it can effectively serve the entire center. The chain-store and dry storage warehouses are placed at the side of the market near the space for expansion. These firms may carry out their operation in conjunction with the market or separately.

Rail tracks are arranged to use a minimum of switches and footage. Double tracks are behind buildings to provide for maximum direct unloading into facilities, permit unloading into trucks or buildings, and facilitate switching. Space is provided for a third track behind most buildings in case an extra track should be needed for switching. Team tracks are located at one side of the plan, next to the fresh fruit and vegetable section; dealers in fresh fruits and vegetables are the main users of such tracks. The fresh fruit and vegetable section is also located on the edge of the market because it would have a large volume of traffic.

Since grocery wholesalers are also expected to have a great deal of traffic, they are located at the opposite edge of the market from fresh fruit and vegetable dealers. Many grocery firms are devel-



distribution center.

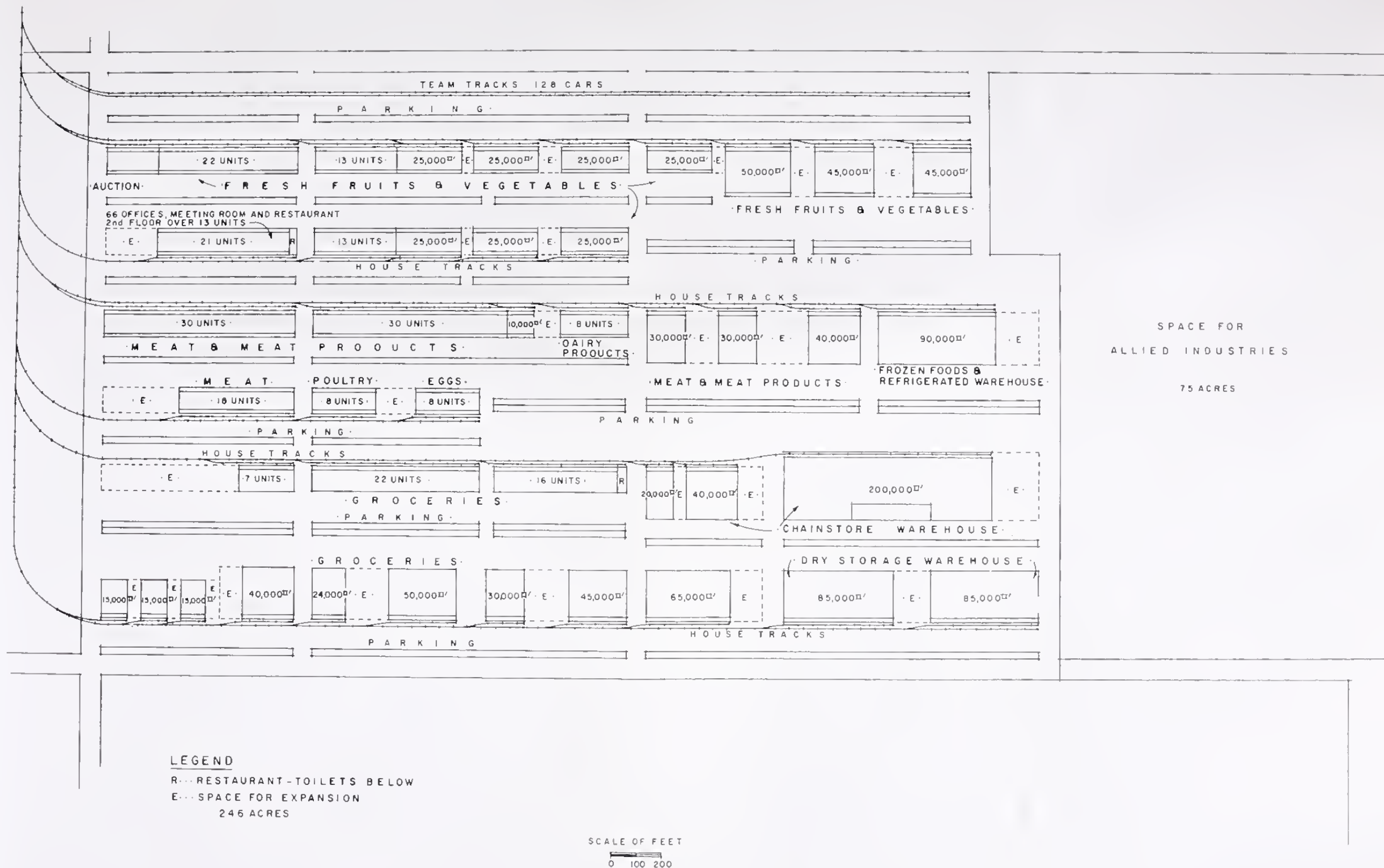


FIGURE 23.—This master plan shows an arrangement of the facilities recommended for a Boston wholesale food distribution center.

oping cash and carry operations, which tend to draw buyers to the market. In addition, many of the grocery firms in single-occupancy buildings are service wholesalers with large fleets of trucks serving the distribution area. The single-occupancy buildings are located so that firms in them can be out of the stream of other traffic and be near the dry storage or refrigerated warehouses.

Dealers in meat and meat products are located between the fruit and vegetable and grocery sections. Dealers in poultry, eggs, and dairy products are located in the same rows of buildings as meat and meat product dealers because of the complementary nature of the products. The location of these two commodity groups near each other facilitates possible use of a central refrigeration system if it should prove economical.

Expansion areas for single-occupancy buildings are provided next to each building. There is also some expansion area next to most of the multiple-occupancy buildings. Firms located in multiple-occupancy buildings may also expand by increasing their use of high stacking in their original space, by acquiring vacated units, or by building new facilities in the area set aside for allied industries or expansion.

Selecting a Site for a New Market

A food distribution center should be centrally located for the population to be served and convenient for railroad and highway movement. The people most directly concerned with the selection of a site for a new market are the firms operating in the market. But buyers and other groups also have an interest in the location. A municipality has a definite interest in the site selection because of its concern with city planning, traffic management, health and other regulations, and the services a food center would require. Full consideration should be given to all trade and transportation groups using the market.

Factors To Be Considered

In reaching a conclusion as to the best possible site for a market, the following factors should be considered.

Convenience for local buyers.—About 56 percent of the food handled through Boston wholesale food channels is distributed locally to retail stores, restaurants, hotels, institutions, and other outlets in the metropolitan area. For this reason, a wholesale food distribution center should be located at a point where a minimum of time and travel is required both by buyers to shop and sellers to distribute commodities and return to their establishments. The ideal market site from this point of view would be one located as near as possible to the center of distribution, assuming of course that traffic arteries are adequate. In Boston, this point would be on the Charles River between the Massachusetts Institute of Technology and the Har-

vard campuses. This site would also have the advantage of being northwest of the hub, which is the direction of population growth. This area would be impossible to develop for a food center, but a site as close as possible to this area is desirable.

Convenience for out-of-town buyers.—The wholesale food market of Boston serves a very wide area; movement of food products beyond the metropolitan area represents a substantial part of the total business. Thus, it is important to consider out-of-town business as well as the distribution and service that may be rendered to local outlets.

The existing central artery and the proposed interstate road program could make almost any site adjacent to these roads convenient for out-of-town buyers. However, distribution patterns out of Boston indicate a site west or north of the city on a major arterial highway would be most convenient for out-of-town buyers.

Convenience for rail and truck receipts.—Rail receipts of independent food dealers, not including cars of merchandise delivered direct to chain-stores, accounted for 45 percent of total receipts. This large volume of rail receipts makes it necessary that the proposed new food distribution center be located with good access to railroad facilities.

In addition to the Union Freight Line Railroad, three major railroads, the New Haven, the New York Central System, and the Boston and Maine, handle food commodities. In selecting the market site, consideration should be given to the various railroad switching arrangements so that perishable products can be properly handled. A review of the arrangements of existing rail facilities shows that it would be impossible to find a location within a 29-mile radius of Boston where the three main line railroads could join for servicing one site. It is important, therefore, that the site be convenient to railroad interchanges because probably only one line would do switching within the market.

As the hub of New England, Boston has historically been the converging point for the railroads. It will soon realize this same accessibility by highway. The John Fitzgerald Expressway, the Southeast Expressway, the Northeast Expressway, and the Massachusetts Turnpike will soon be complemented by the extensions of Interstate 93 and Interstate 95, and the John Fitzgerald Expressway. The many radial highways leading away from the city complete the picture of Boston as the great center of a regional transportation system.

This vast highway network entering Boston is tied together by Circumferential Route 128, which intersects all major highways and encircles the metropolitan area. In addition, this highway crosses all major railroad lines entering the city.

Truck receipts came from scattered producing and processing areas. Substantial amounts of fruits and vegetables were received from the south

and west. Large quantities of meat and packing-house products, poultry, eggs, dairy products, and other food items were trucked from assembly and processing plants as far west as California.

Avoidance of nonmarket traffic.—The handling of food products at wholesale necessitates the use of many trucks and other vehicles. The normal and necessary movement of merchandise in and out of a wholesale market burdens streets and invites traffic congestion. The presence of non-market vehicles impedes normal movement and causes further congestion. Conversely, market traffic interferes with other traffic. Therefore, a site should be selected which will minimize the conflict between these two types of traffic.

Availability of land.—Availability can be considered a relative term when applied to a site for a food distribution center. It is possible under certain conditions to make almost any area available. Certainly, it would be better to select a site where the owner wants to sell at a reasonable price. If a nucleus of a site were available, it might be acquired at the outset; however, in almost every case where markets have been constructed, the surrounding land values have increased. If sufficient land is purchased initially, the total cost of the land will be less than it is likely ever to be again.

Availability of utilities.—Utilities are almost universally available in the Metropolitan Boston area, but in cases where they are not available, extensions may be expensive. Under certain conditions the cost for extension of utilities may have to be paid by the developer; under other conditions, the cost would be paid by the city because provision of utilities to a site might be considered a public improvement.

Physical features of a site.—The general topography of a site and particularly its shape are important factors. A site that is extremely long and narrow usually cannot be efficiently utilized, and a site requiring an excessive amount of filling or piling adds excessively to the cost of the entire project. A vital factor in the Boston area would be the cost of placing the site in condition to build. Engineers indicate that piling would be generally required anywhere within the city of Boston. It is their opinion that areas outside the city may not require piling unless they are near the waterways or the sea. No definite decision regarding piling can be made without test borings.

Number of owners.—The problem of land assembly may be complicated when dealing with many separate owners of small parcels. Therefore, if possible, the total acreage needed should be purchased from a single owner.

Possible Sites

A number of sites within Metropolitan Boston have sufficient acreage for a food distribution center. In addition to these sites, the power of eminent domain could be used to assemble land. An

analysis of all available or possible sites would be a major study beyond the scope of this report. Therefore, a detailed study was made only of representative sites with a potential for development as a food center.

Possible sites were suggested by various organizations, officials of the Boston Redevelopment Authority, transportation agencies, wholesale food dealers, and other interested individuals. Sites were sought on each of the three major railroads, close to the downtown area, near the city, and in outlying areas near Route 128. These sites are located in South Boston, Everett-Chelsea, Woburn, Canton, and Natick (fig. 24).

South Boston.—Two possible areas in South Boston might be developed for the proposed food center. Site A is in the area of the South Boston Market Terminal, and site B is near the New-market facilities for the wholesale distribution of meat.

Within site A is the largest section of unoccupied land in South Boston, the U.S. Naval Annex property. It contains approximately 35 acres. Negotiations are underway for the property to be released to the Massachusetts Port Authority. It is understood that the Authority would not sell the property but could make it available for development under a long-term lease. Next to this property is land presently held by the New Haven Railroad, all or part of which might be made available. However, there would be some problems regarding relocation of railroad trackage. These two pieces of land should be sufficient to solve the most urgent problems of relocation and could serve as a nucleus for food center development. To provide the 246 acres required for market development and to round out a plot of proper shape for efficient use, it would be necessary to acquire additional land within the following boundaries: North, Summer Street; east, Dorchester Street extended; south, Second Street; and west, B Street extended. This area would include the present South Boston wholesale food facilities.

Site B consists of about 26 acres presently unoccupied. The New Haven Railroad loop tracks, turn around, and car wash circle the area. Several small parcels of vacant land nearby might be made available for development of a food center, but considerably more land would be required. To obtain the 246 acres required for a complete development, it would be necessary to acquire land within the following boundaries: North, Fourth Street Bridge; east, Dorchester Avenue-Old Colony Avenue; south, Southampton; and west, John Fitzgerald Expressway.

Similar problems would be encountered in developing either of these sites as a wholesale food distribution center. Acquisition of a complete site would be difficult because most of the acreage needed is presently occupied and the land is owned by many individuals. Also, considerable demolition would be required. A public or quasi-public

agency would probably have to assemble and develop either site. Hence, the estimated costs of these sites are based on the assumption that some governmental agency would assemble the land and make it available for market purposes for less than its current market value. The problems of assembling many parcels and the probable price that would have to be paid by a private developer would seem to rule out these sites unless government assistance is provided.

Since these sites are made up of a number of parcels of land, it is impossible to enumerate all possible engineering problems. It is generally thought that subsoil conditions are unstable and would require piling or spread footing.

The South Boston sites are zoned as heavy industrial and the necessary utilities are available. Site A might have problems with traffic because of its location adjacent to Summer Street, a major downtown thoroughfare. This situation could be partly alleviated if the proposed terminus of the Massachusetts Turnpike is located near the site. Site B borders the Southeast Expressway with proximity to interchanges; therefore, truck access to this area would be adequate. The New Haven Railroad serves both of these sites, and they are well located with respect to the railroad yards. These sites are about $2\frac{1}{2}$ to 3 miles from the center of distribution.

There are so many uncertainties regarding the costs of acquiring either of these South Boston sites and placing them in condition to build that it is impossible to make a reliable estimate of their cost. The market value of the required acreage is high. Their acquisition without the use of eminent domain is probably impossible. The amount of write-down, if any, that could be made is unknown. The subsoil conditions and amount of piling needed cannot be known without making many borings. Hence, for the purpose of comparing the cost of these South Boston sites with others, all that can be done with the information available is to make an assumption about their cost. It is difficult to see how even with a large write-down the cost of land in this area placed in condition to build (including demolition and piling) could be less than \$100,000 per acre. If either of these sites is selected, extensive studies will be needed to determine land costs, and the figures thus derived can be substituted for those assumed here.

Their location in South Boston, a prime industrial area, makes it necessary to consider other possible uses of these sites as alternatives to their selection for a food distribution center. Final determination of the best land use for this area will be the responsibility of property owners and officials of the city of Boston. Detailed layouts of the proposed facilities on these sites may be seen in figures 25 and 26 in the appendix.

Everett-Chelsea.—Within the towns of Everett (121 acres) and Chelsea (45 acres) is a possible

site of about 166 acres, which has one owner. Additional land could be made available in Chelsea to meet the 246-acre requirement. The site is located about $\frac{1}{2}$ mile from the Boston city limits and about 3 miles from Faneuil Hall. The boundaries are: North, Boston and Maine and New York Central railroads; east, Spruce Street and Island End River; west, Rover Street extended; south, cement company property. The area was formerly used for coke manufacturing operations, but all equipment has been removed. Small parts of the area are used for a grocery wholesaling operation and for nonfood industries.

The site is irregular in shape and varies in elevation. An engineering study indicates that a rough grade of about 14 feet could be established with a minimum of outside fill. About half of the site was filled at the turn of the century and has had sufficient time to compact. About one-quarter was filled in 1948 and probably would not require piling before construction.

Two railroads serve the area, the New York Central and the Boston and Maine, and the site is within switching limits of both railroads.

Highway access to Boston would be possible in two ways: By Broadway Street via either Rover Street or Beecham Street in Everett to Broadway Street, and by the additional truck route that is being planned by the city of Chelsea. The latter route would provide direct access to the Mystic River Bridge via Williams Street, but traffic using this route would be subject to a toll charge at this bridge.

Utilities are available and could be provided from either city. Sewage was formerly handled by a system of septic tanks, but this system has been abandoned because of Massachusetts' public health regulations. The Metropolitan District Commission trunk sewer crosses the upper northwest corner of the site and is now being used for sanitary sewage disposal.

This site is zoned as heavy industrial. It is in a prime industrial area close to Boston. It offers advantages to firms located outside the city, and nonmarket traffic would not be a problem.

It is estimated that the site could be acquired for \$1 per square foot. Construction of a culvert and preparation of the site, including fill, would be included in this cost. However, piling requirements would not be included. The cost of the site is estimated at about \$43,560 per acre. A detailed layout of the proposed facilities on this site may be seen in figure 27 in the appendix.

Woburn.—In the town of Woburn, at the intersection of Route 128 and Washington Street, is a site containing between 700 and 800 acres. The boundaries of this site are: North, Woburn and Wilmington town lines; east, Interstate 93; south, Mishawum Road; west, approximately 1,500 feet east of the Boston and Maine Railroad. This property is about 10 miles from the center of dis-

tribution. The site is presently zoned as light industrial.

In general, the site is uneven with slight knolls, and it contains a swamp. A high tension line intersects the center of the property. Grading and filling could be done with little or no outside fill. Test borings would be required to determine whether piling would be necessary.

Rail service could be provided by the Boston and Maine Railroad; however, the site is not within the switching limits.

This site would place out-of-town buyers and incoming trucks at an advantage because of location. Local buyers might find it inconvenient, and the wholesalers in the market might have to provide an extensive delivery system. Nonmarket traffic would not be a problem.

Utilities are available. Water and sewer connections could be made to city lines.

The site could be assembled for about 50 cents per square foot, with development costs of about 20 cents per square foot. The total cost per acre would be about \$30,000 or 70 cents per square foot without allowance for possible piling.

Natick.—In west Natick, just east of Framingham town line, is approximately 300 acres of vacant land. It is about 14 miles from the center of distribution and about 7 miles west of Route 128 on a narrow highway (West Central Street). The boundaries of this site are: North, West Central Street; east, approximately 3,000 feet from high tension wire tower in southwest corner of the site; and south and west, high tension lines.

The site is rolling farmland and no major problems regarding grading would be anticipated. It is doubtful that the area would require piling, but engineering studies would be necessary before a definite decision could be made.

Rail service is provided by the New York Central Railroad. The railroad maintains its piggy-back unloading facilities in nearby Framingham, but the site is not within the railroad's switching limits. Truck access would be questionable unless the narrow two-lane highway serving the area is widened.

Utilities would be available, and sewage could be handled by the Framingham sewerage line. The area is presently zoned as residential, and some difficulty might be expected in acquiring a light industrial classification. This site is owned by one individual. Distance of the site from the city of Boston and difficulty of access to the site would be among the major disadvantages. There should be no problems with nonmarket traffic. Since the railroad that serves this site runs parallel to and between the highway and the site, a grade-crossing would be necessary.

The land could be purchased for an estimated 45 cents per square foot, and about 15 cents per square foot would be required to put it in condition to build. Therefore, the total cost per acre would be \$26,000, or 60 cents per square foot.

Canton.—In Canton, immediately south and west of the New Haven Railroad station, is an area of approximately 1,100 acres. It is one of the major areas of undeveloped land in the Boston metropolitan area. It is about 12 miles from the center of distribution. The boundaries of this site are: North, proposed Interstate 95; east, New Haven Railroad; southwest, Neponset Street.

The site varies from wooded to marshy land. The Neponset River, which flows near the site, is scheduled to be dredged and to have its course changed when the new interstate highway is constructed. This could provide necessary fill for the low areas. The land is vacant with the exception of Canton Airport, which is not in use. The piling requirements cannot be determined until engineering studies have been made.

The New Haven Railroad could serve the site from its Readville yards, if sufficient traffic volume were available. However, this area is not within the Boston switching limits. Highway access is rather complicated and inadequate, but the situation will be improved with the construction of Interstate 95, which will provide an interchange with Route 128 in proximity to the site.

Utilities and sewer lines are available, and the site is zoned as industrial. Since the land is under single ownership, land assembly would not present a problem. Because of its location, the area should not be bothered with nonmarket traffic. The site would be convenient to out-of-town buyers, particularly from the south shore areas, because they could avoid downtown Boston traffic. However, it is probable that a delivery system would be necessary to serve the buyers in the downtown areas.

The site could be purchased for about 60 cents per square foot, and about 15 cents would be required for site preparation. Therefore, the total estimated cost of this site without piling would be 75 cents per square foot, or \$33,000 per acre.

Summary.—Each of the six sites has specific advantages. Two sites are located within the city, another in the direction of population growth, and others offer low acquisition costs. Certain sites would be easier to obtain than others. Some sites offer convenience to in-town buyers, and others would better serve out-of-town buyers. All sites are adequately served by rail, but some are not within rail switching limits, an important item when dealing with perishable commodities. Access for trucks is generally good, but for some sites access roads would need improvement. Zoning would not present a problem on most sites.

Although it is beyond the scope of this report to select and recommend a specific site, it should be pointed out that any of these sites could be used to develop a food distribution center for Metropolitan Boston. An appraisal of the sites, in terms of this report, is given in table 12.

Possible layouts of the proposed market facilities on South Boston sites A and B and on the

TABLE 12.—*An appraisal of six possible sites for a proposed wholesale food distribution center for Boston*

Site	Boundaries	Acreage	Estimated cost per acre in construction to build	Present land use	Topography, soil condition	Access to rail transportation	Access to highways	Distance from center of retail distribution
South Boston, site A.	North, Summer St.; east, Dorchester St. extended; south, Second St.; west, B St. extended.	246 acres ---	1 \$100,000	35 acres (now unoccupied) is U.S. Navy Annex property; small parcels are vacant.	Level, with poor subsoil conditions.	Direct access to New Haven Railroad yards assures adequate rail service.	Summer St. provides access to Southeast Expressway and the Mystic River Bridge, and the Massachusetts Turnpike. There is heavy traffic congestion.	3 miles.
South Boston, site B.	North, Fourth St. Bridge; east, Dorchester Ave.-Old Colony Ave.; south, Southampton; west, John Fitzgerald Expressway.	246 acres ---	1 \$100,000	26 acres and various small parcels are vacant.	Level, with poor subsoil conditions.	Direct access to the New Haven Railroad yards assures adequate rail service.	Near Old Colony Ave. on the east and Southeast Expressway on the west.	2½ miles.
Everett-Chelsea.	North, Boston and Maine and New York Central Railroads; east, Spruce St. and Island End River; west, Rover St. extended; south, cement company property.	246 acres ---	\$43,560	149.2 acres are vacant; 10 acres are used for grocery warehousing and 6.8 acres are used by industries unrelated to food.	Varies in elevation and would require some fill. About half of site suitable for building at present.	The New York Central and the Boston and Maine Railroad serve the area, and the site is within the Boston switching limits of both railroad.	Present access to Boston and northern New England via Broadway to Malden Bridge through Everett; city of Chelsea is planning access to Boston and South Shore via Mystic River Bridge.	3½ miles.

Woburn-----	North, Woburn and Wilmington town lines; east, Interstate 93; south, Afsharum Rd.; west, about 1,500 feet east of Boston and Maine Railroad.	700 to 800 acres.	\$30, 000	Vacant but high tension lines intersect the property.	Uneven, with several knolls and a lake depression or swamp; test borings necessary to determine if piling is required.	Service would be provided by the Boston and Maine Railroad; however, the site is not within the Boston switching limits.	Near Interstate 93 on the east; 93 connects with Circumferential Route 128, which provides access to routes in and around Boston.	10¼ miles.
Natick-----	North, West Central St.; east, about 3,000 feet from high tension wire tower in southwest corner of site; south, high tension line; west, high tension line.	300 acres	\$26, 000	Farmland	Rolling farmland; engineering study required to determine building conditions.	Service would be provided by the New York Central Railroad. The railroad has its piggyback unloading facilities near the site, but the site is not within the Boston switching limits.	West Central St. is a narrow, two-lane highway; unless it is widened, truck access to the site would be questionable.	14 miles.
Canton-----	North, proposed Interstate 95; east, New Haven Railroad; southwest, Neponset St.	1,100 acres.	\$33, 000	Vacant with exception of Canton Airport, which is not in use.	Part of the site is marshy. Fill could be obtained from the Neponset River, which is scheduled to be dredged and to have course changed when a new interstate highway is constructed.	The New Haven Railroad could serve this site if sufficient volume were available. The site is not within the Boston switching limits.	Access to the site by highway is rather complicated and inadequate. The situation will improve with the construction of Interstate 95, which will provide an interchange with Route 128 near the site.	11½ miles.

¹ Assuming a write-down by a public agency.

Everett-Chelsea site may be seen in the appendix. In placing the master plan on these sites, limitations in parking areas were necessary. Layouts of the market on the Woburn, Canton, and Natick sites could follow the master plan shown in figure 23.

Estimated Investment Cost

The initial investment in a food distribution center in Boston would involve two major components, land and facilities. Considerable variation is possible in these costs, depending on location of the site and construction indices at the time construction of the facilities is undertaken.

For the sites described, land cost was estimated to vary from \$26,000 to \$100,000 per acre. The actual cost per acre of an individual site cannot be definitely established until negotiations for purchase are made. But in order that land costs may be taken into consideration and reasonably sound conclusions drawn, the estimated acreage costs were used in computing investment costs. For purposes of this report, the cost for 75 acres for allied industries was excluded from the computations. The estimated costs of 171 acres on the various sites are:

	<i>Million dollars</i>
South Boston, site A or B (with write-down) ---	17.1
Everett-Chelsea -----	7.4
Woburn -----	5.1
Natick -----	4.4
Canton -----	5.6

These estimates were based on reviews of recent real estate transactions in the city, interviews with local real estate developers, and estimates made by city officials familiar with land transactions. The estimates do not include demolition, extending utilities or sewers, piling, or related costs.

The specific kind and amount of facilities planned for this project are based on the estimated volume of business and general requirements of the wholesale firms relocating.

Facility costs are based upon Boston construction indices for 1964, construction costs in the Boston area, and estimates made by local contractors.

Estimates for multiple-occupancy buildings are for the completed buildings, and include in each unit a mezzanine or second floor with stairway, toilets, fluorescent lighting fixtures, display lighting outlets, gas or electric space heaters, and lighting for platforms. They do not include such features as partitioned offices, refrigeration, or specialized equipment, except for the meat units, which are provided with refrigeration and meat rails. Refrigeration requirements of the firms occupying multiple-occupancy units should be determined before construction so that necessary insulation can be provided in the floors.

The estimated costs for the single-occupancy buildings are for the completed structures. They

do not include such special provisions as mezzanines, but do include toilets, lighting fixtures, and heating equipment. Cost for the refrigerated warehouse includes insulation, refrigeration equipment, and installed cooler doors.

The 66 offices and the restaurant-meeting room would be completely finished and ready for occupancy, but would not include office equipment or furnishings. Costs for the offices and restaurant-meeting room are included in costs for the fresh fruits and vegetables group.

Paving estimates have been prorated for each commodity group to allocate a fair share of the cost of market street construction. Paving costs are for a foundation of 7 inches of gravel or crushed rock, 4 inches of macadam base, and 2 inches of asphaltic concrete surface. For areas where oil or gasoline drippings would be commonplace, concrete paving 6 inches deep is suggested because of the softening or dissolving effect these liquids have upon asphalt.

The costs also include sprinkler systems for fire protection in multiple-occupancy buildings, storm sewers, sanitary sewers, 8-foot chain link fencing, floodlights, and rail spurs and switches. All utility connections (including electric connections) were assumed to be underground.

Rates used for the architect's fee (6 percent), the construction loan (5 percent), and the contingency fund (10 percent) are the usual rates charged on such construction. The rate for the construction loan (5 percent) is for the total cost of the loan and is not an interest rate.

ESTIMATED CONSTRUCTION COSTS ARE NOT INTENDED TO REPLACE FIRM ESTIMATES MADE BY LOCAL ARCHITECTS AND CONTRACTORS, AND SHOULD BE CONSIDERED ONLY AS ILLUSTRATIVE.

Table 13 gives a summary of investment costs for land and facilities, by commodity group. A breakdown of the construction costs, including the architect's fee, the construction loan, and the contingency allowance, is given in the following tabulations. The estimated costs are based on the arrangement in the master plan previously described.

Fresh Fruits and Vegetables

1. Multiple-occupancy facilities:

A. Buildings:¹

70 units with mezzanines (one unit used as a restaurant) @ \$24,600 per unit, or \$9.84 per sq. ft., computed on the basis of 2,500 sq. ft. of first floor space ² ----	<i>Dollars</i> 1, 722, 000
Basement and toilet facilities in restaurant unit-----	2, 500
Sprinkler system for multiple-occupancy units, 204,750 sq. ft.-----	60, 375
66 offices over 9 units—15,750 sq. ft. @ \$7.10 per sq. ft.-----	111, 825
Restaurant-meeting hall over 4 units; 220-seat capacity, plus kitchen and storage room—7,000 sq. ft. @ \$7.10 per sq. ft.---	49, 700

See footnotes at end of table.

1. Multiple-occupancy facilities—Continued	
A. Buildings—Continued	<i>Dollars</i>
Sprinkler system for offices and restaurant—22,750 sq. ft.-----	6, 825
B. Other facilities:	
Trackage—7,705 ft. @ \$15 per linear foot ^{3,4} -----	115, 575
Railroad switches—3 @ \$2,500 ^{3,4} -----	7, 500
Paving (blacktop combination)—50,866 sq. yds. @ \$3.50-----	178, 030
Sewers:	
3,100 feet—15-inch (storm) @ \$3.50--	10, 850
2,250 feet—12-inch (sanitary) @ \$2.25-----	5, 062
Floodlights—13 @ \$150-----	1, 950
Fencing (8 ft.) ⁵ —1,280 feet @ \$3.50-----	4, 480
Public address system-----	950
Cost of buildings and other facilities--	2,277, 622
C. Associated construction costs:	
Architect's fee ⁶ -----	136, 657
Construction loan ⁷ -----	120, 714
Contingency allowance ⁸ -----	253, 499
Total, buildings, other facilities, and associated costs-----	2, 788, 492
2. Single-occupancy facilities:	
A. Buildings: ¹	
7 buildings totaling 175,000 sq. ft. @ \$9.84 per sq. ft.-----	1, 722, 000
1 building of 50,000 sq. ft. @ \$9.84 per sq. ft.-----	492, 000
2 buildings totaling 90,000 sq. ft. @ \$9.84 per sq. ft.-----	885, 600
1 building (for fruit auction) of 20,000 sq. ft. @ \$9.84 per sq. ft.-----	196, 800
B. Other facilities:	
Trackage ^{3,4} —5,095 feet @ \$15 per linear foot-----	76, 425
Railroad switches ^{3,4} —10 @ \$2,500-----	25, 000
Paving (blacktop combination)—138,594 sq. yds. @ \$3.50-----	485, 078
Sewers:	
3,950 feet—15-inch (storm) @ \$3.50--	13, 825
3,025 feet—12-inch (sanitary) @ \$2.25-----	6, 806
Floodlights—23 @ \$150-----	3, 450
Fencing (8 ft.)—2,432 feet @ \$3.50 ⁵ -----	8, 512
Cost of buildings and facilities-----	3, 915, 496
C. Associated construction costs:	
Architect's fee ⁶ -----	234, 930
Construction loan ⁷ -----	207, 521
Contingency ⁸ -----	435, 795
Total, buildings, other facilities, and associated costs-----	4, 793, 742
Total, fresh fruits and vegetables-----	7, 582, 234

Groceries

1. Multiple-occupancy facilities:	
A. Buildings: ¹	
46 units including mezzanines (one unit used as a restaurant) @ \$29,520 per unit or \$9.84 per sq. ft., computed on the basis of 3,000 sq. ft. of first floor space ⁹ -----	1, 357, 920
Basement and toilet facilities in restaurant-----	3, 000
Sprinkler system—161,460 sq. ft.-----	45, 929
B. Other facilities:	
Trackage—2,750 feet @ \$15 per linear foot ⁴ -----	41, 250

See footnotes at end of table.

1. Multiple-occupancy facilities—Continued	
B. Other facilities—Continued	<i>Dollars</i>
Railroad switches—3 @ \$2,500 ⁴ -----	7, 500
Paving (blacktop combination)—36,363 sq. yds. @ \$3.50 per sq. yd.-----	127, 270
Sewers:	
3,100 feet—15-inch (storm) @ \$3.50--	10, 850
1,550 feet—12-inch (sanitary) @ \$2.25-----	3, 488
Floodlights—10 @ \$150-----	1, 500
Fencing (8 ft.)—896 feet @ \$3.50 ⁵ -----	3, 136
Cost of buildings and other facilities--	1, 601, 843
C. Associated construction costs:	
Architect's fee ⁶ -----	96, 111
Construction loan ⁷ -----	84, 898
Contingency allowance ⁸ -----	178, 285
Total cost of buildings, other facilities, and associated costs-----	1, 961, 137
2. Single-occupancy facilities:	
A. Buildings: ¹	
3 buildings containing a total of 45,000 sq. ft. @ \$9.84 per sq. ft.-----	442, 800
1 building containing 20,000 sq. ft. @ \$9.84 per sq. ft.-----	196, 800
1 building containing 24,000 sq. ft. @ \$9.84 per sq. ft.-----	236, 160
1 building containing 30,000 sq. ft. @ \$9.84 per sq. ft.-----	295, 200
1 building containing 40,000 sq. ft. @ \$9.84 per sq. ft.-----	393, 600
1 building containing 45,000 sq. ft. @ \$9.84 per sq. ft.-----	442, 800
1 building containing 50,000 sq. ft. @ \$9.84 per sq. ft.-----	492, 000
1 building containing 65,000 sq. ft. @ \$9.84 per sq. ft.-----	639, 600
Total, buildings-----	3, 138, 960
B. Other facilities:	
Trackage—4,080 feet @ \$15 per linear foot ⁴ -----	61, 200
Railroad switches—10 @ \$2,500 ⁴ -----	25, 000
Paving (blacktop combination)—91,305 sq. yds. @ \$3.50 per sq. yd.-----	319, 568
Sewers:	
3,000 feet—15-inch (storm) @ \$3.50--	10, 500
1,500 feet—12-inch (sanitary) @ \$2.25-----	3, 375
Floodlights—14 @ \$150-----	2, 100
Fencing (8 ft.)—2,048 feet @ \$3.50 ⁵ -----	7, 168
Cost of buildings and other facilities--	3, 567, 871
C. Associated construction costs:	
Architect's fee ⁶ -----	214, 072
Construction loan ⁷ -----	189, 097
Contingency allowance ⁸ -----	397, 104
Total cost of buildings, other facilities, and associated costs-----	4, 368, 144
Total, groceries-----	6, 329, 281

Meat

1. Multiple-occupancy facilities:	
A. Buildings: ¹	
78 units @ \$24,600 per unit, or \$9.84 per sq. ft. for 2,500 sq. ft. of first floor space--	1, 918, 800
Second floor containing 1,800 sq. ft. @ \$1.015 per unit ¹⁰ -----	79, 170
Sprinkler system—140,400 sq. ft. (second floor)-----	44, 620
Insulation—462,384 sq. ft. (first floor only) @ \$3 per sq. ft.-----	1, 387, 152
Meat rails for 78 units @ \$7,500 per unit (first floor only)-----	585, 000

See footnotes at end of table.

1. Multiple-occupancy facilities—Continued	
A. Buildings—Continued	<i>Dollars</i>
Refrigeration equipment and distribution system—7 tons per unit @ \$1,200 per ton or \$8,400 per unit-----	655,200
B. Other facilities:	
Trackage—4,000 ft. @ \$15 per linear foot ⁴	60,000
Railroad switches—2 @ \$2,500 ⁴ -----	5,000
Paving (Blacktop combination)—53,890 sq. yds. @ \$3.50-----	188,615
Sewers:	
Grease traps (special) 78 units @ \$300 per unit-----	23,400
2,175 feet—15-inch (storm) @ \$3.50-----	7,612
2,375 feet—12-inch (sanitary) @ \$2.25--	5,344
Floodlights—8 @ \$150-----	1,200
Fencing (8 ft.)—1,408 feet @ \$3.50 ⁵ -----	4,928
Cost of buildings and other facilities---	4,966,041
C. Associated construction costs:	
Architect's fee ⁶ -----	297,962
Construction loan ⁷ -----	263,200
Contingency allowance ⁸ -----	552,720
Total, buildings, other facilities, and associated costs-----	6,079,923
2. Single-occupancy facilities:	
A. Buildings: ¹	
1 building containing 10,000 sq. ft. @ \$9.84 per sq. ft.-----	98,400
1 building containing 40,000 sq. ft. @ \$9.84 per sq. ft.-----	393,600
2 buildings containing a total of 60,000 sq. ft. @ \$9.84 per sq. ft.-----	590,400
-----	1,082,400
B. Other facilities:	
Trackage—1,400 feet @ \$15 per linear foot ⁴ -----	21,000
Railroad switches—4 @ \$2,500 ⁴ -----	10,000
Paving (blacktop combination)—33,110 sq. yds. @ \$3.50-----	115,885
Sewers:	
1,225 feet—15-inch (storm) @ \$3.50-----	4,288
1,000 feet—12-inch (sanitary) @ \$2.25--	2,250
Floodlights—8 @ \$150-----	1,200
Fencing (8 ft.)—768 feet @ \$3.50 ⁵ -----	2,688
Cost of buildings and other facilities---	1,239,711
C. Associated construction costs:	
Architect's fee ⁶ -----	74,383
Construction loan ⁷ -----	65,705
Contingency allowance ⁸ -----	137,980
Total, buildings, other facilities, and associated costs-----	1,517,779
Total, meat and meat products-----	7,597,702

Poultry, Eggs, and Dairy Products

1. Poultry and egg multiple-occupancy facilities:	
A. Buildings: ¹	
16 units @ \$29,520 per unit, or \$9.84 per sq. ft., for 3,000 sq. ft. of first floor space--	472,320
Second floor containing 2,160 sq. ft. per unit @ \$1,015 per unit ¹⁰ -----	16,240
Sprinkler system—67,200 sq. ft. (first floor and mezzanine)-----	24,480
B. Other facilities:	
Trackage—1,120 ft. @ \$15 per linear foot ⁴	16,800
Railroad switches—2 @ \$2,500 ⁴ -----	5,000
Paving (Blacktop combination)—14,665 sq. yds. @ \$3.50-----	51,328

See footnotes at end of table.

1. Poultry and egg multiple-occupancy facilities—Con.	
B. Other facilities—Continued	<i>Dollars</i>
Sewers:	
1,000 feet—15-inch (storm) @ \$3.50---	3,500
500 feet—12-inch (sanitary) @ \$2.25--	1,125
Floodlights—4 @ \$150 each-----	600
Fencing (8 ft.)—384 feet @ \$3.50 ⁵ -----	1,344
Cost of buildings and other facilities---	592,737
C. Associated construction costs:	
Architect's fee ⁶ -----	35,564
Construction loan ⁷ -----	31,415
Contingency allowance ⁸ -----	65,972
Total, buildings, other facilities, and associated costs-----	725,688
2. Dairy products multiple-occupancy facilities:	
A. Buildings:	
8 units with mezzanines @ \$29,520 per unit, or \$9.84 per sq. ft., for 3,000 sq. ft. of first floor space ¹⁰ -----	236,160
Sprinkler system—20,080 sq. ft. (first floor and mezzanine)-----	6,624
B. Other facilities:	
Trackage—500 feet @ \$15 per linear foot ⁴	7,500
Railroad switches—1 @ \$2,500 ⁴ -----	2,500
Paving (blacktop combination)—7,849 sq. yds. @ \$3.50 per sq. yd.-----	27,472
Sewers:	
500 feet—15-inch (storm) @ \$3.50-----	1,750
225 feet—12-inch (sanitary) @ \$2.25--	506
Floodlights—2 @ \$150-----	300
Fencing (8 ft.)—128 feet @ \$3.50 ⁵ -----	448
Cost of buildings and other facilities---	283,260
C. Associated construction costs:	
Architect's fee ⁶ -----	16,996
Construction loan ⁷ -----	15,013
Contingency allowance ⁸ -----	31,527
Total, buildings, other facilities, and associated costs-----	346,796
Total, poultry, eggs, and dairy products-----	1,072,484

Other

1. Refrigerated warehouse:	
A. Building: ¹	
1 single-occupancy building containing 90,000 sq. ft. with a 20-foot ceiling height, or 1,800,000 cu. ft.-----	2,685,600
B. Other facilities:	
Trackage—1,000 feet @ \$15 per linear foot ⁴ -----	15,000
Railroad switches—1 @ \$2,500 ⁴ -----	2,500
Paving (blacktop combination)—43,070 sq. yds. @ \$3.50 per sq. yd.-----	150,745
Sewers:	
900 feet—15-inch (storm) @ \$3.50-----	3,150
450 feet—12-inch (sanitary) @ \$2.25--	1,012
Floodlights—4 @ \$1.50-----	600
Fencing (8 ft.)—640 feet @ \$3.50 ⁵ -----	2,240
Cost of building and other facilities---	2,860,847
C. Associated construction costs:	
Architect's fee ⁶ -----	171,651
Construction loan ⁷ -----	151,625
Contingency allowance ⁸ -----	318,412
Total, buildings, other facilities, and associated costs-----	3,502,535

See footnotes at end of table.

2. Chainstore warehouses:	
A. Single-occupancy buildings: ¹	<i>Dollars</i>
1 building containing 40,000 sq. ft. @ \$9.84 per sq. ft.-----	393,600
1 building containing 200,000 sq. ft. @ \$9.84 per sq. ft.-----	1,968,000
B. Other facilities:	
Trackage—1,200 ft. @ \$15 per linear foot ⁴ -----	18,000
Railroad switches—1 @ \$2,500 ⁴ -----	2,500
Paving (blacktop combination)—39,269 sq. yds. @ \$3.50 per sq. yd.-----	137,442
Sewers:	
2,000 feet—15-inch (storm) @ \$3.50-----	7,000
1,000 feet—12-inch (sanitary) @ \$2.25-----	2,250
Floodlights—10 @ \$150 each-----	1,500
Fencing (8 ft.)—1,664 feet @ \$3.50 ⁵ -----	5,824
Cost of buildings and other facilities--	2,536,116
C. Associated construction costs:	
Architect's fee ⁶ -----	152,167
Construction loan ⁷ -----	134,414
Contingency allowance ⁸ -----	282,270
Total cost, buildings, other facilities, and associated costs-----	3,104,967
3. Dry storage warehouses:	
A. Single-occupancy buildings: ¹	
2 buildings containing a total of 170,000 sq. ft. @ \$9.84 per sq. ft.-----	1,672,800
B. Other facilities:	
Trackage—2,100 feet @ \$15 per linear foot ⁴ -----	31,500
Railroad switches—2 @ \$2,500 ⁴ -----	5,000
Paving (blacktop combination)—45,695 sq. yds. @ \$3.50 per sq. yd.-----	159,932
Sewers:	
900 feet—15-inch (storm) @ \$3.50-----	3,150
450 feet—12-inch (sanitary) @ \$2.25-----	1,012
Floodlights—4 @ \$150-----	600
Fencing (8 ft.)—1,152 feet @ \$3.50 ⁵ -----	4,032
Cost of buildings and other facilities--	1,878,026
C. Associated construction costs:	
Architect's fee ⁶ -----	112,682
Construction loan ⁷ -----	99,535
Contingency allowance ⁸ -----	209,024
Total cost, buildings, other facilities, and associated costs-----	2,299,267
Total, other-----	8,906,769
GRAND TOTAL-----	31,488,470

¹ Costs are based on Boston construction indices, January 1964. These figures are composite costs; the cost per unit or building could be expected to decrease as the size of the unit is expanded or increased as specialized features are incorporated.

² Mezzanines contain 425 sq. ft. each.

³ Includes pro rata share of team tracks.

⁴ Includes a prorated share of lead-in tracks. The cost of tracks and switches are based on information supplied by the New York, New Haven and Hartford Railroad.

⁵ Prorated.

⁶ Architect's fee, 6 percent of building and facilities cost.

⁷ Construction loan, 5 percent of building and facilities cost and architect's fee.

⁸ Contingency allowance, 10 percent of building and facilities cost, architect's fee, and construction loan.

⁹ Mezzanines contain 510 sq. ft. each.

¹⁰ Based on cost necessary to extend mezzanine included in similar units.

Financing and Operating a Food Distribution Center

Competent management is imperative in directing the orderly development and operation of a wholesale food distribution center. The finest in overall market design and construction will not insure the success of a new food distribution center, unless it is properly promoted and soundly managed.

Producers, processors, transportation companies, wholesalers, retailers, and consumers are concerned with the operation of the market. Investors, insurance companies, and city officials also are concerned. The investors, whether private or public funds are used, have a right to expect a reasonable return on their investment and assurance that their interests will be protected. The board of directors, or other governing body, should be sufficiently capable to look after the interests of all these groups.

If a new wholesale food distribution center is established to replace the present market areas, it is important that its owners not exploit the industry. Certain safeguards should be provided because the market should function as a public facility. As the market becomes established as a going concern, and as its income becomes dependable and reasonable returns to the investors are made, the reason for precautions will become even more apparent.

Regardless of who may construct and finance the center, there should be definite assurances that:

- (1) It will be properly located, designed, and equipped.
- (2) Overbuilding will be prevented to assure maximum occupancy.
- (3) Funds will be invested wisely to provide for real needs, so that increased efficiency will not be offset by high rents.
- (4) Facilities will be used in the best interest of the industry and the public.
- (5) It will be operated without discrimination against buyer, seller, mode of transportation, or origin of shipment.

Methods of Financing

Some of the more common methods of financing food-distribution centers are private corporations, public benefit corporations, direct public ownership, and a combination. The following descriptions of these methods are adapted from a report on types of ownership and methods of financing.⁶

Private corporation.—A private corporation, organized to own and operate a wholesale food center, is a legal entity, organized in conformity with State statutes and made up of individuals bound together for a common purpose or objective.

⁶ Clowes, Harry G., Elliott, William H., and Crow, William C., WHOLESALE FOOD MARKET FACILITIES, TYPES OF OWNERSHIP AND METHODS OF FINANCING. U.S. Dept. Agr. Mktg. Res. Rpt. 160, 96 pp., illus. 1957.

TABLE 13.—*Summary of investment costs for a proposed wholesale food distribution center for Boston, by commodity group and site*¹

Commodity group	South Boston, sites A and B	Everett- Chelsea	Woburn	Natick	Canton
Fresh fruits and vegetables:	<i>1, 000 dollars</i>	<i>1, 000 dollars</i>	<i>1, 000 dollars</i>	<i>1, 000 dollars</i>	<i>1, 000 dollars</i>
Facilities ²	7, 582	7, 582	7, 582	7, 582	7, 582
Land (58.6 acres).....	5, 860	2, 552	1, 758	1, 524	1, 934
Total.....	13, 442	10, 134	9, 340	9, 106	9, 516
Groceries:					
Facilities ³	6, 329	6, 329	6, 329	6, 329	6, 329
Land (40.0 acres).....	4, 000	1, 742	1, 200	1, 040	1, 320
Total.....	10, 329	8, 071	7, 529	7, 369	7, 649
Meat and meat products:					
Facilities.....	7, 598	7, 598	7, 598	7, 598	7, 598
Land (25.6 acres).....	2, 560	1, 115	768	665	845
Total.....	10, 158	8, 713	8, 366	8, 263	8, 443
Poultry, eggs, and dairy products:					
Facilities.....	1, 073	1, 073	1, 073	1, 073	1, 073
Land (6.2 acres).....	620	270	186	162	204
Total.....	1, 693	1, 343	1, 259	1, 235	1, 277
Refrigerated warehouse:					
Facilities.....	3, 503	3, 503	3, 503	3, 503	3, 503
Land (11.9 acres).....	1, 190	518	357	309	393
Total.....	4, 693	4, 021	3, 860	3, 812	3, 896
Chainstore warehouses:					
Facilities.....	3, 105	3, 105	3, 105	3, 105	3, 105
Land (14.6 acres).....	1, 460	636	438	380	482
Total.....	4, 565	3, 741	3, 543	3, 485	3, 587
Dry storage warehouses:					
Facilities.....	2, 299	2, 299	2, 299	2, 299	2, 299
Land (13.8 acres).....	1, 380	601	414	359	455
Total.....	3, 679	2, 900	2, 713	2, 658	2, 754
Total investment, all groups:					
Facilities.....	31, 489	31, 489	31, 489	31, 489	31, 489
Land (170.7 acres).....	17, 070	7, 434	5, 121	4, 439	5, 633
Total.....	48, 559	38, 923	36, 610	35, 928	37, 122

¹ Does not include 75 acres of land for allied industries.

² Includes cost of restaurant, offices, and restaurant-meeting hall.

³ Includes one unit as a restaurant.

A private corporation usually is organized for profit, but may be operated as a nonprofit organization.

When a private corporation is operated for profit, there are usually no restrictions on the sale of voting stock to any individual because of his occupation or profession, nor on the number of shares of voting stock that may be held by any one individual. Stockholders have one vote in corporate affairs for each share of voting stock held. A number of wholesale food markets are owned and operated by private corporations. In

some instances, the principal stockholders in these corporations are the tenants. In other cases, the corporation is a railroad company or some other firm that was primarily organized for another type of business. Most of the large terminal produce markets built in the 1920's were sponsored by railroad companies.

To form a private corporation, the incorporators usually obtain a charter from the State. This charter defines the powers of the corporation and of its officers and directors. It specifies the stockholders' rights and how control shall be exercised.

Among the characteristics of a private corporation is the power of the board of directors to make decisions quickly and without the delay found in some other types of organization. Often, this executive authority is exercised through the immediate management. Quick decisions on major policy matters may be the difference between success and failure of the organization. In addition, when the period of amortization expires, the entire investment belongs to the stockholders, tenancy changes have no effect upon stock ownership, and transfer of stock is unrestricted.

Wholesale food markets owned by private corporations tend to become so-called "closed" markets. Some have prohibited the delivery of food items brought in by truck, especially out-of-State trucks. Often, private corporations do not provide space for expansion, either for increased volume or for new food handlers and allied industries. The major problem of corporate ownership lies in the fact that substantial financial equity is required. Private corporation market sponsors have sometimes found it more difficult to obtain funds to take care of preliminary organization and equity fund acquisition than public market sponsors.

A nonprofit private corporation is not an agency of government, but must be organized in conformity with existing State statutes. In a nonprofit private corporation, participation in corporate rights and activities is usually based either on a system of dues, which limits each member (stockholder) to one vote, or bylaws, which restrict ownership of voting stock to one share per member. As a rule, State statutes place no limitations on participation in the corporation because of the business or occupation. However, membership in such corporations can usually be limited or restricted through bylaws. Thus, it is possible for those who are directly interested in the ownership and operation of a wholesale center to form a nonprofit corporation to construct and operate the market. An example of a nonprofit private corporation is the small business investment company, set up under the Small Business Administration. Following is a short description of this type of organization.

The Congress in 1958 enacted the Small Business Investment Act, establishing a program to stimulate the flow of private equity capital and long-term loans for the sound financing of the operations, growth, expansion, and modernization of small business concerns. Under this act, the Small Business Administration is authorized to make loans to so-called "State development companies" or to local development companies, and to license and regulate and give financial assistance to privately organized, privately financed companies called "small business investment companies."

A development company is a profit or nonprofit enterprise incorporated under State law, with au-

thority to promote and assist the growth and development of small businesses in specific areas. A State development company is a corporation organized under a special legislative act to operate statewide. A local development company is a corporation with a broad base of ownership under any applicable State laws, to further the economic development of its communities.

The Small Business Administration is authorized to make loans to State and local development companies in exchange for obligations of the development company. It is also authorized to make loans for plant construction, conversion, or expansion, and the acquisition of land. Such loans may be made either directly or in cooperation with banks or other lending institutions. Certain rules and regulations have been set up defining eligible business categories and needed collateral.

Public benefit corporation.—Public benefit corporations, sometimes called "market authorities," offer some desirable features not found in other types of ownership. They differ from nonprofit private corporations only in that they are publicly owned.

A public benefit corporation is a nonprofit agency. Rentals and other charges do not exceed the amount needed to pay the costs of operation, amortize the original investment, and maintain a limited contingency fund. Under public ownership the revenues would be considered as public funds, and these funds could not be paid to lessees as dividends. However, there is the possibility that these funds might be appropriated for other public uses while bonds remained outstanding, unless such funds were specifically committed to redemption of bonds.

Public benefit corporations usually have the power of eminent domain, which can be useful in the acquisition of a site. Such corporations usually finance market improvements through the sale of revenue bonds. This type of financing normally is not a full obligation of a State or a political subdivision. These revenue bonds are often tax exempt; therefore, the interest cost is lower. A public agency, such as a market authority, is more likely than some types of private ownership to provide for future expansion and to work toward the establishment of a complete wholesale food distribution center. A market authority may or may not be required to pay taxes to the community in which it is located.

Market authorities have certain limitations, especially with respect to the financing and management of the facilities. They find it difficult to raise funds through revenue bonds unless considerable equity funds are provided in some way or the bonds are guaranteed by the city, county, or State. Some State or city governments have appropriated part of the funds needed for land acquisition and original construction. The continuity of management may be dependent on the continuance of a State or municipal government

administration in office. As a whole, market authorities do not have as complete freedom of operation as is possible under private ownership.

Direct public ownership.—A number of wholesale food market facilities have been financed, constructed, and operated by States, counties, or municipalities. Several States and some municipalities have enabling legislation covering the improvement or establishment of produce markets.

Direct State ownership and operation usually can be differentiated from ownership and operation by a State market authority by the methods of financing used and the delegation of authority made by the State legislature. Although some States have appropriated funds and otherwise assisted market authorities with financial problems, they do not usually underwrite the total cost of a market constructed by an authority, nor have the States always assumed responsibility for the operation of these markets.

Under direct State ownership, a market facility is financed in whole or in part by an appropriation of State funds. If the financing is not entirely by this method, the State usually is obligated for the remainder unless this balance is obtained through grants or donations. Also, the State is responsible for maintenance and other expense involved in the operation of a State-owned market.

States may finance, construct, and operate wholesale food market facilities because legislative bodies feel that improved facilities will in themselves serve the public interest.

Municipal ownership of a wholesale food market is comparable in many of its basic aspects to direct State ownership. Some municipalities are authorized in their charters to construct and operate food markets. However, in some cases, city councils or commissions are not authorized to make appropriations from general funds in the city treasury for the construction of market facilities on a basis comparable to that of a State legislative body. Three methods are usually open to municipalities for financing a market program: (1) Issuance of municipal bonds, (2) issuance of revenue warrants, and (3) loans from public corporations. In most cities the issuance of bonds for such purposes must be approved by a majority of the qualified electorate voting in a referendum.

Facilities constructed with municipal or county funds would necessarily be owned by the county or municipality, and rent would have to be paid by the tenants indefinitely.

Combinations.—Because of the complexity of building large wholesale food distribution centers, they sometimes are not built completely either by public or private agencies. Recent construction in the Northeast typifies the possibilities of various combinations.

In Philadelphia, the food distribution center was built by a nonprofit corporation on land owned and put into condition for building by the city. The city subordinated its interest in the land so

that the land could be used as equity in borrowing money for building construction. When the multiple-occupancy units were built, the development company leased the units to operating stock companies formed by the prospective tenants. At the end of 30 years all buildings will become the property of the city, except for the parcels sold by the developing company with city approval for construction of single-occupancy buildings.

A fresh fruit and vegetable distribution center is under construction in New York City. This center is being constructed by the city, which will make direct leases to tenants. The city expects to manage and maintain the center, which is being financed through general obligation bonds. Individual wholesalers will supply their own refrigeration equipment and provide their own offices.

One approach to developing a food distribution center for Boston, similar to that used in Philadelphia, would be for an overall organization to construct part or all of the center, by dealing with individual corporations set up by wholesalers in the various commodity groups. The overall organization—the developer—could be a private corporation, a public benefit corporation, or the city or State government. The developer could have overall operating and financial responsibility for the market. The commodity corporations could be formed by wholesalers planning to locate in multiple-occupancy buildings. Firms who would use single-occupancy facilities would probably deal directly with the overall market organization, but could be included in the appropriate commodity corporations.

Wholesalers interested in dealing as a group with the overall organization could apply for a corporation charter as a private trade corporation. All common stock of such a corporation would be owned by the occupants of the facilities. The number of shares owned by each tenant could be based on the amount of facilities occupied.

Under this plan, each trade corporation would deal directly with the overall organization by leasing the land and arranging for the construction; or the market center organization could finance and construct the individual buildings and lease them to the trade corporation. The trade corporation management could work directly with the parent organization while the facilities were being built. After construction, the trade corporation could take over management functions in its section. It would assess dealers a monthly rental, which would include all costs of management, promotion, and maintenance services, taxes, and the amount of amortization of its obligations for its facilities, plus funds for taxes, amortization, and operating costs.

Under this plan the developer of the food distribution center would be spared many of the details of operation and management and would be able to confine its activities to developing plans for construction of facilities, working with dealer

corporations and with managers of individual facilities, and engaging in promotional activities to obtain the greatest benefit from the overall development. The decision about the method of financing and organization to be used must rest with the financiers and the wholesale food firms who will be tenants of the market.

Financing and Operating Costs

Since it is not known what type of agency will build the food distribution center, for purposes of this study it has been assumed that the suggested facilities would be constructed on 171 acres by a single agency and leased to the tenants.

THESE ASSUMPTIONS ARE NOT INTENDED TO SUGGEST THE MOST DESIRABLE ARRANGEMENT, NOR ARE THEY INTENDED TO EXCLUDE OTHER ARRANGEMENTS. THEY ARE PRESENTED SO THAT SOME ESTIMATE OF PROBABLE OPERATING EXPENSES MAY BE INCLUDED IN THIS REPORT.

The operating costs and revenue requirements for the proposed facilities under a private corporation will be considered under three categories: (1) Debt service, (2) taxes on real estate, and (3) management and maintenance costs.

In some market developments, the cost for organization and development is included in the cost of building the facility, which would of course affect the amount needed for debt service. This cost is not shown here, because it was assumed that such cost would be borne by the developer or a responsible city agency. The local governments in several of the areas under consideration as potential sites have offered to assume this cost if the proposed facilities are developed in their areas. If for some reason this cost is not absorbed by one of the agencies mentioned, both the amount of investment needed and the operating costs would be higher.

Debt service.—The major item of costs that must be paid by a wholesale food distribution center is debt service. If the market is to be self-liquidating, the investment must be repaid from market revenue, and certain standards for payment must be adhered to. The proportion of the total investment that might be borrowed on a mortgage loan and the terms of the loan depend to some extent on the money market. Facilities of the type recommended should not become obsolete in less than 20 to 30 years, and should have a useful life extending over a longer period. The recommended facilities, because of their design, could be converted to many uses.

The money required for the project would probably be obtained from three sources: (1) First mortgage bonds, (2) second mortgage bonds or preferred stock, and (3) equity capital. The amounts that could be obtained from each of these

sources would depend on the money market at the time of financing. In general, about 65 percent might be obtained from a first mortgage, and 20 to 25 percent on a second mortgage, or issuance of preferred stock. The remaining 10 to 15 percent could be from equity capital.

For purposes of this report, a rate of 6 percent amortized over 25 years was assumed. This rate represents a composite of varying rates from each of the capital sources. If the first mortgage were obtained at 5½ percent, the second mortgage at 6½ percent, and the equity capital had a return of 7 percent, the average interest rate would be about 6 percent. If the equity capital were supplied by tenants in proportion to the relative cost of facilities, payment of dividends to stockholders might not be desirable because of the tax situation. In this event, the 6 percent interest rate might be slightly higher than the actual cost of borrowing the required capital. If bonds were issued, financiers and persons purchasing the bonds would probably demand that current income exceed current expenses and that a fund to guarantee payment be created.

Boston financiers have indicated that the normal fund requirements would be about 1 year's total payment, or approximately \$3 million. This amount could be borrowed as part of the initial issue. The escrow could be invested in an approved bank or savings and loan association or in U.S. Treasury bonds, and the interest applied to amortization of the loan. At an annual interest rate of 6 percent amortized over 25 years, the annual cost of this fund would be \$235,000. This amount could be offset by earnings of the escrow account, assumed to be 4 percent annually, or \$120,000. The net escrow account cost would be \$115,000 per year.

Until a financial plan has been developed, the terms of the loan cannot be known. However, to determine the amount required for rental of the various facilities, the rate of 6 percent for 25 years on the cost of the facilities, plus a \$3 million escrow account, was used. Based on these assumptions, the annual revenue required for debt service (table 14) would range from \$2.9 to \$3.9 million, depending on the site selected.

Real estate taxes.—One of the major expenses involved in the operation of the proposed market facilities through private financing would be tax on real property and improvement.

The entire project could expect to pay taxes on land, buildings, and other taxable facilities. The 1964 tax rates per \$1,000 of assessed valuation, in the various jurisdictions, based on the full market value, were:

Boston	-----	\$61.40
Everett	-----	19.10
Chelsea	-----	81.40
Woburn	-----	35.00
Natick	-----	32.80
Canton	-----	33.50

TABLE 14.—*Estimated annual debt service payments for the proposed wholesale food distribution center, by commodity group and site*

Commodity group	South Boston, sites A and B	Everett- Chelsea	Woburn	Natick	Canton
	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
Fresh fruits and vegetables:					
Amortization ¹	1,052	793	731	712	744
Amortization of escrow account ²	30	30	30	30	30
Total debt service.....	1,082	823	761	742	774
Groceries:					
Amortization ¹	808	632	589	577	599
Amortization of escrow account ²	24	24	24	24	24
Total debt service.....	832	656	613	601	623
Meat and meat products:					
Amortization ¹	795	681	654	647	661
Amortization of escrow account ²	26	26	26	26	26
Total debt service.....	821	707	680	673	687
Poultry, eggs and dairy products:					
Amortization ¹	132	105	98	97	99
Amortization of escrow account ²	4	4	4	4	4
Total debt service.....	136	109	102	101	103
Refrigerated warehouse:					
Amortization ¹	367	315	302	298	305
Amortization of escrow account ²	12	12	12	12	12
Total debt service.....	379	327	314	310	317
Chainstore warehouses:					
Amortization ¹	357	293	277	273	281
Amortization of escrow account ²	11	11	11	11	11
Total debt service.....	368	304	288	284	292
Dry storage warehouses:					
Amortization ¹	288	227	212	208	215
Amortization of escrow account ²	8	8	8	8	8
Total debt service.....	296	235	220	216	223
GRAND TOTAL:					
Amortization ¹	3,799	3,046	2,863	2,812	2,904
Amortization of escrow account ²	115	115	115	115	115
Total debt service.....	3,914	3,161	2,978	2,927	3,019

¹ Based on 6 percent over 25 years or on the total investment cost (table 13) \$78.23 per \$1,000.

² At the annual interest rate of 6 percent amortized over 25 years, the annual cost of the \$3 million escrow account would be \$235,000. This would be offset by earnings of the escrow account, assumed to be 4 percent annually, or about \$120,000. The net escrow payment required would be \$115,000.

Tax rates and assessed valuations in the Boston area vary with the individual jurisdiction. Although tax rates are published, assessments are subject to negotiation. To provide an equitable basis for comparison of sites, the full market value of the land and facilities was used in calculating taxes for each site.

For the Everett-Chelsea site, where there is a substantial difference in the tax rates of the two areas, a weighted average tax rate of \$37.33 per \$1,000 was used.

It is possible that in later years the tax rate may increase. For this reason, a contingency of 10 percent has been included in the annual estimated real estate taxes (table 15).

Management and maintenance.—The costs for management of the food distribution center include salaries for the manager and his staff, legal and auditing services, office rental, utilities, travel and business expenses, advertising and promotion fees, office equipment and supplies, and communi-

TABLE 15.—*Estimated annual real estate taxes to be paid by the proposed wholesale food distribution center for Boston, by commodity group and site*

Commodity group	South Boston, sites A and B	Everett- Chelsea	Woburn	Natick	Canton
	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
Fresh fruits and vegetables:					
Tax ¹ -----	825	378	327	299	319
Contingency ² -----	83	38	33	30	32
Total-----	908	416	360	329	351
Groceries:					
Tax ¹ -----	634	301	263	242	256
Contingency ² -----	63	30	26	24	27
Total-----	697	331	289	266	283
Meat and meat products:					
Tax ¹ -----	624	326	293	271	283
Contingency ² -----	62	32	29	27	28
Total-----	686	358	322	298	311
Poultry, eggs, and dairy products:					
Tax ¹ -----	104	50	44	41	43
Contingency ² -----	10	5	4	4	4
Total-----	114	55	48	45	47
Refrigerated warehouse:					
Tax ¹ -----	288	150	135	126	131
Contingency ² -----	29	15	14	12	13
Total-----	317	165	149	138	144
Chainstore warehouses:					
Tax ¹ -----	280	140	124	114	120
Contingency ² -----	28	14	12	11	12
Total-----	308	154	136	125	132
Dry storage:					
Tax ¹ -----	226	108	95	87	92
Contingency ² -----	23	11	10	9	9
Total-----	249	119	105	96	101
GRAND TOTAL:					
Tax ¹ -----	2,981	1,453	1,281	1,180	1,244
Contingency ² -----	298	145	128	117	125
Total-----	3,279	1,598	1,409	1,297	1,369

¹ Based on total investment in land and facilities (table 13).

² 10 percent of tax payment.

cations. The maintenance costs would include street cleaning, snow removal, repairs and upkeep, and insurance. To comply with various codes and to reduce the cost of fire insurance, it was assumed the buildings would be equipped with sprinkler systems. Estimates by liability and fire insurance underwriters indicated that the rates for liability insurance would be approximately \$0.944 per 100 square feet of building and parking area. Fire and extended coverage of buildings is based on approximately \$0.10 per \$100 of building value. These rates do not include insurance for property of the tenants.

Street cleaning and general maintenance costs were based on information provided by the city of Boston and private maintenance companies. These costs have been applied to all buildings and facilities provided in the food center.

To provide for increases in management and maintenance costs, a 10 percent fund was added.

Annual management and maintenance costs for the entire food center are estimated to be—

<i>Management:</i>	<i>Dollars</i>
Salaries:	
Market manager-----	20,000
Assistant market manager-----	12,000
Secretarial and bookkeeping staff-----	15,000

<i>Management—Continued</i>		<i>Dollars</i>
Legal and auditing services-----		5,000
Office rental-----		3,600
Utilities-----		8,000
Travel and business expenses-----		3,500
Advertising and promotion-----		5,000
Office equipment and supplies-----		2,500
Communications-----		1,000
<i>Maintenance:</i>		
Watchmen-----		20,000
Insurance: Liability, fire, and extended coverage ¹ -----		45,000
Street cleaning and snow removal-----		35,000
General maintenance for multiple-occupancy buildings ² -----		75,000
<i>Contingency</i> -----		25,000
Total costs-----		275,660

¹ Rates are based on estimates by leading Boston underwriters; actual rates would be determined at time of investigation for actual coverage. Liability insurance was determined on the basis of total square feet in a building. For fire and extended coverage, the building would be insured at 80 percent of its value. This coverage was applied only to the buildings and is based on cost of construction.

² Based on $\frac{3}{4}$ of 1 percent of cost of buildings and other facilities.

Total annual revenue required.—Estimates of the amount of annual revenue needed to operate this development, including cost of management and maintenance, real estate taxes, and debt service, may be seen in table 16. Costs of operations for individual firms occupying these facilities are not included. Annual costs of financing and operating the food distribution center would range from \$4.5 to \$7.5 million, depending on the site.

Estimated Rentals Required

The only major source of revenue for the proposed food center was assumed to be rent charged for facilities. The estimated rent required per square foot of building area at the various sites is shown for the commodity groups and the refrigerated, dry storage, and chainstore warehouses in table 17. These rentals are based on private financing and operation of the food center. Rentals could be materially affected by the methods used to finance and operate the market.

The rent per square foot as shown in the table is based on the total building area planned for each commodity group or warehouse, and does not take into consideration differences in building structure or facilities provided in buildings. For example, all units in multiple-occupancy buildings for dealers in meat and meat products would be refrigerated and would include meat rails; rent for these units would be higher than rent for unrefrigerated units. Also, the building area shown for the fresh fruit and vegetable group includes space for offices and a restaurant-meeting hall on the second floor of one multiple-occupancy building. In addition, two restaurants are provided in multiple-occupancy buildings for fresh fruits and vegetables and groceries. Rent per square foot for this space would be proportionately higher

than that for dealer units in multiple-occupancy buildings.

In these estimated rentals, no provision was made for vacancies. When construction of the food center begins, long-term leases should be signed by tenants to prevent vacancies or overbuilding.

Estimated Cost Reductions

The estimated cost reductions apply to the 303 independent wholesalers for whom facilities have been provided. Although not measured, savings from efficiencies in operations would accrue to the refrigerated, dry storage, and chainstore warehouses.

The proposed facilities have been specifically designed for the commodities to be handled. Since both multiple- and single-occupancy buildings have operating space on one level, unnecessary handling and resultant losses can be materially reduced. The continuous platforms that serve the multiple-occupancy buildings should reduce the cost of transfers between dealers and eliminate many of the present awkward and costly loading and unloading practices. Direct rail service to all buildings should reduce cartage costs and the extra handling involved. The wide streets and adequate parking areas, away from nonmarket traffic, should reduce congestion and eliminate avoidable delays to trucks.

The savings that can be expected in the new facilities, however, could be offset by poor handling methods and improper space utilization. The facilities are designed so that modern materials-handling equipment, such as industrial trucks and conveyor systems, can be used, and space can be used effectively with pallet racks or other modern methods of stacking products.

Estimates of the handling and other costs incurred in moving commodities through the proposed food distribution center, as presented in this section of the report, are based on research by the Department of Agriculture on operating costs within modern terminal facilities, using proper kinds and amounts of handling equipment.

Estimates of annual savings in the proposed food distribution center, over 1961 costs in the present market, are given by commodity and by site in table 18. Regardless of which site is selected for construction of a food distribution center, there would be savings in the costs. Breakdowns of costs incurred in moving commodities through the market, compared with costs for 1961 in the present market, are given in tables 19 to 23. Cost items listed in tables 19 to 23 are the same as those discussed earlier in the section "Handling and Other Costs."

Table 19 shows costs that do not vary with the site—the costs of moving commodities to dealers' facilities and the costs of handling within the market, excluding rental of facilities. Tables 20

TABLE 16.—*Estimated total annual revenue required to operate and finance the facilities in the proposed wholesale food distribution center, by commodity group and site*

Commodity group	South Boston, sites A and B	Everett- Chelsea	Woburn	Natick	Canton
	<i>1, 000 dollars</i>	<i>1, 000 dollars</i>	<i>1, 000 dollars</i>	<i>1, 000 dollars</i>	<i>1, 000 dollars</i>
Fresh fruits and vegetables: ¹					
Debt service.....	1, 082	823	761	742	774
Real estate taxes.....	908	416	360	329	351
Management and maintenance.....	72	72	72	72	72
Total.....	2, 062	1, 311	1, 193	1, 143	1, 197
Groceries: ²					
Debt service.....	832	656	613	601	623
Real estate taxes.....	697	331	289	266	284
Management and maintenance.....	58	58	58	58	58
Total.....	1, 587	1, 045	960	925	965
Meat and meat products:					
Debt service.....	821	707	680	673	687
Real estate taxes.....	686	358	322	298	310
Management and maintenance.....	61	61	61	61	61
Total.....	1, 563	1, 126	1, 063	1, 032	1, 058
Poultry, eggs and dairy products:					
Debt service.....	136	109	102	101	103
Real estate taxes.....	114	55	48	45	47
Management and maintenance.....	8	8	8	8	8
Total.....	258	172	158	154	158
Refrigerated warehouse:					
Debt service.....	379	327	314	310	317
Real estate taxes.....	317	165	149	138	144
Management and maintenance.....	29	29	29	29	29
Total.....	725	521	492	477	490
Chainstore warehouses:					
Debt service.....	368	304	288	284	292
Real estate taxes.....	308	154	136	125	132
Management and maintenance.....	27	27	27	27	27
Total.....	703	485	451	436	451
Dry storage warehouses:					
Debt service.....	296	235	220	216	223
Real estate taxes.....	249	119	105	96	101
Management and maintenance.....	21	21	21	21	21
Total.....	566	375	346	333	345
GRAND TOTAL:					
Debt service.....	3, 914	3, 161	2, 978	2, 927	3, 019
Real estate taxes.....	3, 279	1, 598	1, 409	1, 297	1, 369
Management and maintenance.....	276	276	276	276	276
Total.....	7, 469	5, 035	4, 663	4, 500	4, 664

¹ Including offices and restaurants.

² Including one restaurant.

TABLE 17.—*Estimated annual rentals required per square foot of building area for the proposed wholesale food distribution center, by commodity group and site*¹

Commodity group	Total building area provided	Rental per square foot ²				
		South Boston sites A and B	Everett-Chelsea	Woburn	Natick	Canton
	<i>1,000 square feet</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Fresh fruits and vegetables:						
Stores.....	537	3. 65	2. 25	2. 05	1. 95	2. 05
Offices and restaurants (2d floor).....	23	4. 25	4. 00	3. 75	3. 75	3. 75
Restaurants.....	3	4. 00	3. 75	3. 50	3. 50	3. 50
Total or average.....	563	3. 65	2. 35	2. 15	2. 05	2. 15
Groceries:						
Stores.....	476	3. 30	2. 15	2. 00	1. 95	2. 00
Restaurants.....	4	4. 00	3. 75	3. 50	3. 50	3. 50
Total or average.....	480	3. 30	2. 20	2. 00	1. 95	2. 05
Meat and meat products.....	445	3. 55	2. 55	2. 40	2. 35	2. 40
Poultry, eggs, and dairy products.....	105	2. 50	1. 65	1. 50	1. 50	1. 50
Refrigerated warehouse.....	90	8. 10	5. 80	5. 50	5. 30	5. 45
Chainstore warehouse.....	240	2. 95	2. 05	1. 90	1. 85	1. 90
Dry storage warehouse.....	170	3. 35	2. 25	2. 05	2. 00	2. 05
Grand total or average.....	2, 093	3. 60	2. 45	2. 25	2. 15	2. 25

¹ Based on total annual revenue requirements shown in table 16.

² Rounded up to nearest nickel.

TABLE 18.—*Estimated annual savings in handling and other costs in moving specified commodities through the proposed wholesale food distribution center for Boston (over 1961 costs in present markets), by commodity and site*¹

Commodity	Volume ²	Savings				
		South Boston sites A and B	Everett-Chelsea	Woburn	Natick	Canton
	<i>Tons</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
Fresh fruits and vegetables.....	595, 340	2, 866. 0	3, 764. 6	3, 642. 1	3, 215. 4	3, 242. 0
Groceries.....	163, 036	— 79. 2	505. 5	539. 4	476. 5	453. 4
Meat and meat products.....	81, 482	— 178. 3	277. 8	317. 6	303. 9	284. 5
Poultry, eggs, and dairy products.....	68, 530	156. 3	256. 0	243. 6	195. 7	204. 2
Total.....	908, 388	2, 764. 8	4, 803. 9	4, 742. 7	4, 191. 5	4, 184. 1

¹ Based on tables 19 to 23.

² Based on estimated tonnage relocating.

to 23 give costs for items that vary with the site—the cost of rental of facilities and of distributing commodities from the market. Tables 20 to 23 also show the total costs of moving commodities through the market and total savings, by site, for the four commodity groups involved.

The savings shown for moving commodities to dealers' facilities (table 19) would be achieved through reductions in cartage costs and the elimination of costs due to avoidable delay. Although the cost per ton of carting products from team tracks and boat piers may not vary from the pres-

ent rates, team track receipts would be limited generally to perishable commodities. Allowances were made for continued receipts from boat piers in estimating the volume subject to cartage. With direct rail connections to the facilities, cartage from railroad to wholesalers' warehouses would be insignificant in the meat and poultry, egg, and dairy products operations.

The major savings in the new market would result from reductions in the costs for handling within the market (table 19) because of increased efficiency in handling procedures. The improved facilities, with a single operating level served by platforms at the height of rail car floors and truckbeds make possible reductions in labor costs for unloading, loading, handling within stores, and interdealer transfers.

The unloading of rail cars and trucks would be more efficient in the new market because commodities could be unloaded onto skids or pallets and moved directly into the facilities. Carcass meats could be placed on overhead rails at the edge of the platform and moved to coolers with a minimum of labor. The loading of buyers' trucks should have similar increases in efficiency.

Some commodities could be stacked in the assembly areas or on platforms and loaded directly into buyers' trucks. Commodities could also be loaded directly into buyers' trucks from rail cars at the rear of the facility or from the team tracks. However, most commodities would be restacked, sorted, repacked, or moved into and out of coolers within the store.

The amount of food subject to interdealer movement in the proposed food center would vary depending on the particular commodity. For meat, the quantity would be proportionately higher than for other food items because of the specialized operations of the meat firms. Some fresh fruit and vegetable repackers or specialty handlers might depend on large-volume receivers for their supplies, and, similarly, specialty grocery firms would depend on major importing firms. Other transfers in the market would be limited to seasonal items, fill-ins for customer orders, or distribution of pool cars. The cost per ton would be reduced because such movement could be effected by moving the commodities down a platform or for short distances by truck.

The operations involved in the handling of food commodities within stores would be similar to those in the present facilities, but savings could be achieved by proper organization to reduce unnecessary handling and labor. The use of pallet racks or other efficient stacking and storage procedures would reduce the time required to store products and to assemble them for customers' orders.

A few of the other costs involved in handling within the market would increase. Gains in labor efficiency and space utilization depend partly on use of more efficient handling equipment. Such

equipment has higher ownership and operating costs than equipment used in the present facilities, and it is expected that more equipment would be used. The costs shown for use of handling equipment in table 19 are based on the initial cost and life expectancy of the equipment, operating and maintenance costs, and maximum utilization of the equipment under normal market conditions. Small-volume dealers could form pools and rent equipment to hold down the initial investment cost.

Since wholesale food handlers would have adequate space to handle their products in the proposed facilities, there would be less need to use public warehouses, and demurrage costs should be eliminated. There would be some need to rent public warehouse space to store reserve stocks or to hold items in periods of oversupply. With anticipated proper handling of commodities in adequate facilities, avoidable spoilage should be negligible.

The estimated costs for rental of facilities and for distributing commodities are compared with 1961 costs in the present market in tables 20-23.

The first floor operating areas would be increased for all dealers; refrigeration areas for meat firms would include the entire first floor in multiple-occupancy units. There would be generally improved working conditions, adequate parking, and improved sanitary conditions. In addition, land would be available for expansion. Increased rental is the price that must be paid to improve market conditions.

It is estimated that the total costs for distributing fresh fruits and vegetables, groceries, meat, poultry, eggs, and dairy products from many of the proposed sites would be lower than at the present markets because avoidable delay due to traffic congestion would be eliminated. It is expected that the sites would have good access to major traffic arteries. Total costs for distributing fresh fruits and vegetables, poultry, eggs, and dairy products from either the Natick or Canton sites would be higher than from the other sites or from the present market. The Natick and Canton sites are farther away from the areas where most of these products are distributed.

Nonmeasurable Savings

It is not possible to measure in dollars all savings or benefits that could result from the development and operation of a new wholesale food distribution center. Some of these benefits, which would affect wholesale dealers, producers, buyers, market employees, transportation agencies, consumers, the city of Boston, and other municipalities in the area, are described here.

Wholesale dealers could expect their competitive position to be improved relative to other distributors. Buyers who presently shun the market because of general conditions might return. In

TABLE 19.—*Estimated annual costs of moving food commodities to facilities of 303 independent wholesale center, and costs for 1961 in*

Cost item	Fresh fruits and vegetables					Groceries	
	Volume to be handled in proposed market	Cost in present market	Cost in proposed market		Savings	Volume to be handled in proposed market	Cost in present market
			Average per ton	Total			
Moving commodities to dealers' facilities:	<i>Tons</i>	<i>1,000 dollars</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>Tons</i>	<i>1,000 dollars</i>
Cartage from boat piers or team tracks.....	2, 000	² 120. 3	6. 10	12. 2	108. 1	10, 000	² 80. 4
Receipts not subject to such cartage.....	593, 340					153, 036	
Total receipts.....	595, 340	120. 3		12. 2	108. 1	163, 036	80. 4
Handling within the market: ³							
Labor:							
Unloading rail cars and trucks.....	(593, 340)	585. 4	0. 50	296. 7	288. 7	(153, 036)	266. 7
Interdealer transfers.....	(15, 000)	484. 8	1. 00	15. 0	469. 8	(8, 000)	105. 5
Handling within stores.....	⁴ (610, 340)	1, 931. 5	1. 00	610. 3	1, 321. 2	⁴ (171, 036)	761. 3
Loading buyers' trucks.....	⁴ (610, 340)	455. 7	. 50	305. 2	150. 5	⁴ (171, 036)	283. 0
Total labor.....	⁴ (610, 340)	3, 457. 4	2. 01	1, 227. 2	2, 230. 2	⁴ (171, 036)	1, 416. 5
Other costs:							
Use of handling equipment.....	(595, 340)	38. 0	. 07	41. 7	— 3. 7	(163, 036)	30. 0
Demurrage.....	(595, 340)	68. 5			68. 5	(163, 036)	3. 3
Avoidable spoilage.....	(595, 340)	456. 4			456. 4		
Public warehouse service charge.....						(17, 934)	461. 5
Total, other costs.....	(595, 340)	562. 9	. 07	41. 7	521. 2	(163, 036)	494. 8
Total, handling within the market ³	595, 340	4, 020. 3	2. 13	1, 268. 9	2, 751. 4	163, 036	1, 911. 3
Total, moving commodities to dealers' facilities and handling within market ³	595, 340	4, 140. 6	2. 15	1, 281. 1	2, 859. 5	163, 036	1, 991. 7

¹ Volumes given in parentheses are duplicated in other items.

² Includes cost for avoidable delay to inbound trucks.

the new facilities, it would be possible to regulate selling hours, and thus reduce costs and the time required to get the job done.

Improvements in the operation of the various price-making and price-reflecting forces in the food market could be expected, which could result in increased returns to producers. In the elimination of many inefficient features of the present market, there would be a tendency to pass some of the savings back to the producer in the form of higher prices.

Market employees' working conditions would be improved in the proposed facilities, which should increase employee morale and encourage

greater work efficiency. These buildings have been designed so that with proper handling equipment, workers' jobs would be less strenuous. Over a period of time, this could result in increased earnings per hour through greater productivity. Improved parking facilities, with conveniences readily available, would also serve the workers in the market. The complete rebuilding of the market facilities could improve the general environment in which the workers operate and lead to more regular working hours.

The grouping of dealers by commodities in multiple-occupancy units, the wide streets, and adequate parking areas would enable buyers to

dealers and handling the foods within the market, in all sites of the proposed wholesale food distribution the present Boston markets ¹

Groceries—Con.			Meat and meat products					Poultry, eggs, and dairy products				
Cost in proposed market		Savings	Volume to be handled in proposed market	Cost in present market	Cost in proposed market		Savings	Volume to be handled in proposed market	Cost in present market	Cost in proposed market		Savings
Average per ton	Total				Average per ton	Total				Average per ton	Total	
Dollars 3.00	1,000 dollars 30.0	1,000 dollars 50.4	Tons 81,482	1,000 dollars ² 33.1	Dollars	1,000 dollars	1,000 dollars 33.1	Tons 68,530	1,000 dollars ² 14.5	Dollars	1,000 dollars	1,000 dollars 14.5
	30.0	50.4	81,482	33.1			33.1	68,530	14.5			14.5
1.45	221.9	44.8	(81,482)	114.5	1.40	114.1	0.4	(68,530)	56.5	0.75	51.3	5.2
2.00	16.0	89.5	(14,000)	93.3	1.75	24.5	68.8	(9,000)	15.8	1.50	13.5	2.3
2.50	427.6	333.7	⁴ (95,482)	2,189.4	18.00	1,718.7	470.7	⁴ (77,530)	349.8	3.00	232.6	117.2
1.45	248.0	35.0	⁴ (95,482)	212.5	1.50	143.2	69.3	⁴ (77,530)	97.0	.75	58.1	38.9
5.34	913.5	503.0	⁴ (95,482)	2,609.7	20.95	2,000.5	609.2	⁴ (77,530)	519.1	4.59	355.5	163.6
.21	34.2	-4.2	(81,482)	6.2	.08	6.5	-0.3	68,530	3.3	.10	6.9	-3.6
		3.3	(81,482)	49.1			49.1					
5.73	102.8	358.7	(1,874)	111.3	19.20	36.0	75.3	(6,853)	172.0	14.54	99.6	72.4
.84	137.0	357.8	81,482	166.6	.52	42.5	124.1	68,530	175.3	1.55	106.5	68.8
6.44	1,050.5	860.8	81,482	2,776.3	25.07	2,043.0	733.3	68,530	694.4	6.74	462.0	232.4
6.63	1,080.5	911.2	81,482	2,809.4	25.07	2,043.0	766.4	68,530	708.9	6.74	462.0	246.9

³ Excluding rent for facilities.

⁴ Total received plus interdealer transfers.

shop the various commodity sections with greater ease and in less time. Reducing the time necessary for marketing should reduce purchasing costs. Transportation agencies would be in a better position to serve the market in the proposed facilities. The lack of rail service at present facilities has put railroads at a disadvantage.

Truckers hauling products to and from the market would benefit by being able to unload or load directly at the facilities. Delays caused by traffic congestion and inadequate parking would be eliminated.

The new facilities would provide a location for food or allied firms displaced by urban renewal

or redevelopment programs. The city would benefit because it would then be possible to proceed with the improvement of downtown Boston, achieve better control of traffic, and enforce sanitary, health, and fire codes. Alternative uses for the present market sites could provide a greater source of revenue to the city. The improved competitive position of the market could serve to attract new business to the area.

Consumers of food commodities in the Boston metropolitan area could benefit as much from improved food distribution facilities as any other group. They could expect to receive food in better condition, and some of the savings should be reflected in the prices they pay for food.

TABLE 20.—*Estimated annual costs of moving fresh fruits and vegetables through facilities of 139 for 1961 in the*

Cost item	Volume to be handled in proposed market	Cost in present market	South Boston, sites A and B		
			Average cost per ton	Total cost	Savings
	<i>Tons</i>	<i>1,000 dollars</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
Moving commodities to dealers' facilities and handling within the market ² -----	(595,340)	4,140.6	2.15	1,281.1	2,859.5
Rental of facilities-----	(595,340)	1,320.6	3.46	2,062.0	-741.4
Distributing commodities:					
Within Metropolitan Boston:					
Hub Boston-----	22,734	170.0	6.51	148.0	22.0
Other Boston-----	53,402	461.0	7.06	377.0	84.0
Cambridge-Somerville-----	30,176	237.2	7.08	213.6	23.6
Northeast-----	33,996	359.0	9.56	325.0	34.0
Northwest-----	44,477	432.3	8.71	387.4	44.9
Southwest-----	43,442	476.1	9.79	425.3	50.8
Southeast-----	27,717	300.7	8.81	244.2	56.5
Processors and food chain warehouses-----	45,190	308.8	7.06	319.0	-10.2
Total, Metropolitan Boston-----	301,134	2,745.1	8.10	2,439.5	305.6
Outside Metropolitan Boston-----	294,206	492.3	.17	50.0	442.3
Total distribution-----	595,340	3,237.4	4.18	2,489.5	747.9
GRAND TOTAL-----	595,340	8,698.6	9.80	5,832.6	2,866.0

¹ Volumes given in parentheses are duplicated in other items.

² From table 19.

*independent dealers in the proposed wholesale food distribution center for Boston, by sites, and costs present markets*¹

Everett-Chelsea			Woburn			Natick			Canton		
Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings
<i>Dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
2.15	1,281.1	2,859.5	2.15	1,281.1	2,859.5	2.15	1,281.1	2,859.5	2.15	1,281.1	2,859.5
2.20	1,311.0	9.6	2.00	1,193.0	127.6	1.92	1,143.0	177.6	2.01	1,197.0	123.6
7.50	170.5	-0.5	7.87	178.9	-8.9	9.33	212.1	-42.1	9.74	221.4	-51.4
8.05	429.9	31.1	8.51	454.5	6.5	9.42	503.0	-42.0	9.33	498.2	-37.2
6.76	204.0	33.2	7.05	212.7	24.5	9.60	289.7	-52.5	9.42	284.3	-47.1
6.37	216.6	142.4	8.24	280.1	78.9	13.44	456.9	-97.9	13.35	453.8	-94.8
6.99	310.9	121.4	7.52	334.5	97.8	10.01	445.2	-12.9	10.74	477.7	-45.4
8.76	380.6	95.5	9.69	421.0	55.1	8.51	369.7	106.4	8.42	365.8	110.3
7.78	215.6	85.1	9.60	266.1	34.6	11.07	306.8	-6.1	7.42	205.7	95.0
8.05	363.8	-55.0	8.51	384.6	-75.8	9.42	425.7	-116.9	9.33	421.6	-112.8
7.61	2,291.9	453.7	8.41	2,532.4	212.7	9.99	3,009.1	-264.0	9.72	2,928.5	-183.4
.17	50.0	442.3	.17	50.0	442.3	.17	50.0	442.3	.17	50.0	442.3
3.93	2,341.9	895.3	4.34	2,582.4	655.0	5.14	3,059.1	178.3	5.00	2,978.5	258.9
8.29	4,934.0	3,764.6	8.49	5,056.5	3,642.1	9.21	5,483.2	3,215.4	9.17	5,456.6	3,242.0

TABLE 21.—*Estimated annual cost of moving groceries through facilities of 39 independent in the present*

Cost item	Volume to be handled in proposed market	Cost in present market	South Boston, sites A and B		
			Average cost per ton	Total cost	Savings
	<i>Tons</i>	<i>1,000 dollars</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
Moving commodities to dealers' facilities and handling within the market ²	(163,036)	1,991.7	6.63	1,080.5	911.2
Rental of facilities.....	(163,036)	242.1	9.73	1,587.0	-1,344.9
Distributing commodities:					
Within Metropolitan Boston:					
Hub Boston.....	5,354	43.4	4.74	25.4	18.0
Other Boston.....	21,347	173.3	5.11	109.1	64.2
Cambridge-Somerville.....	9,752	85.2	5.13	50.0	35.2
Northeast.....	12,331	121.7	6.79	83.7	38.0
Northwest.....	16,529	153.6	6.23	103.0	50.6
Southwest.....	14,163	138.8	6.94	98.3	40.5
Southeast.....	8,875	91.8	6.28	55.7	36.1
Processors and food chain warehouses.....	22,625	87.0	2.86	64.7	22.3
Total, Metropolitan Boston.....	110,976	894.8	5.32	589.9	304.9
Outside Metropolitan Boston.....	52,060	57.9	.16	8.3	49.6
Total distribution.....	163,036	952.7	3.67	598.2	354.5
GRAND TOTAL.....	163,036	3,186.5	20.03	3,265.7	-79.2

¹ Volumes given in parentheses are duplicated in other items.

² From table 19.

dealers in the proposed wholesale food distribution center for Boston, by sites, and costs for 1961 market¹

Everett-Chelsea			Woburn			Natick			Canton		
Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings
<i>Dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
6.63	1,080.5	911.2	6.63	1,080.5	911.2	6.63	1,080.5	911.2	6.63	1,080.5	911.2
6.41	1,045.0	-802.9	5.89	960.0	-717.9	5.67	925.0	-682.9	5.92	963.0	-720.9
5.42	29.0	14.4	5.57	29.8	13.6	6.63	35.5	7.9	6.91	37.0	6.4
5.78	123.4	49.9	6.08	129.8	43.5	6.70	143.0	30.3	6.63	141.5	31.8
4.68	45.6	39.6	5.11	49.8	35.4	6.82	66.5	18.7	6.69	65.2	20.0
4.65	57.3	64.4	5.90	72.8	48.9	9.26	114.2	7.5	9.33	115.0	6.7
5.06	83.6	70.0	5.67	93.7	59.9	7.08	117.0	36.6	7.57	125.1	28.5
6.63	93.9	44.9	6.87	97.3	41.5	6.08	86.1	52.7	6.02	85.3	53.5
5.60	49.7	42.1	6.81	60.4	31.4	7.80	69.2	22.6	5.35	47.5	44.3
2.86	64.7	22.3	2.86	64.7	22.3	2.86	64.7	22.3	2.86	64.7	22.3
4.93	547.2	347.6	5.39	598.3	296.5	6.27	696.2	198.6	6.14	681.3	213.5
.16	8.3	49.6	.16	8.3	49.6	.16	8.3	49.6	.16	8.3	49.6
3.41	555.5	397.2	3.72	606.6	346.1	4.32	704.5	248.2	4.23	689.6	263.1
16.44	2,681.0	505.5	16.24	2,647.1	539.4	16.62	2,710.0	476.5	16.76	2,733.1	453.4

TABLE 22.—*Estimated annual cost of moving meat and meat products through facilities of 96 costs for 1961 in*

Cost item	Volume to be handled in proposed market	Cost in present market	South Boston sites A and B		
			Average cost per ton	Total cost	Savings
	<i>Tons</i>	<i>1,000 dollars</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
Moving commodities to dealers' facilities and handling within the market ² -----	(81,482)	2,809.4	25.07	2,043.0	766.4
Rental of facilities-----	(81,482)	551.2	19.18	1,563.0	-1,011.8
Distributing commodities:					
Within Metropolitan Boston:					
Hub Boston-----	2,511	19.5	5.66	14.2	5.3
Other Boston-----	8,582	70.6	6.07	52.0	18.6
Cambridge-Somerville-----	3,197	24.5	6.08	19.4	5.1
Northeast-----	5,589	51.3	7.89	44.1	7.2
Northwest-----	6,762	59.0	7.31	49.4	9.6
Southwest-----	5,374	56.2	8.09	43.5	12.7
Southeast-----	3,517	35.3	7.42	26.1	9.2
Processors and food chain warehouses-----	1,292	5.6	6.04	7.8	-2.2
Total, Metropolitan Boston-----	36,824	322.0	6.97	256.5	65.5
Outside Metropolitan Boston-----	44,658	64.1	1.40	62.5	1.6
Total distribution-----	81,482	386.1	3.91	319.0	67.1
GRAND TOTAL-----	81,482	3,746.7	48.17	3,925.0	-178.3

¹ Volumes given in parentheses are duplicated in other items.

² From table 19.

independent dealers in the proposed wholesale food distribution center for Boston, by sites, and the present market ¹

Everett-Chelsea			Woburn			Natick			Canton		
Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings
<i>Dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
25.07	2,043.0	766.4	25.07	2,043.0	766.4	25.07	2,043.0	766.4	25.07	2,043.0	766.4
13.82	1,126.0	-574.8	13.03	1,062.0	-510.8	12.67	1,032.0	-480.8	12.98	1,058.0	-506.8
6.41	16.1	3.4	6.61	16.6	2.9	7.69	19.3	0.2	7.96	20.0	-0.5
6.80	58.4	12.2	7.10	60.9	9.7	7.81	67.0	3.6	7.71	66.2	4.4
5.60	17.9	6.6	6.01	19.2	5.3	7.91	25.3	-0.8	7.73	24.7	-0.2
5.53	30.9	20.4	6.92	38.7	12.6	10.50	58.7	-7.4	10.59	59.2	-7.9
6.00	40.6	18.4	6.77	45.8	13.2	8.16	55.2	3.8	8.70	58.8	0.2
7.74	41.6	14.6	7.93	42.6	13.6	7.05	37.9	18.3	7.02	37.7	18.5
6.57	23.1	12.2	7.85	27.6	7.7	9.04	31.8	3.5	6.28	22.1	13.2
6.81	8.8	-3.2	7.12	9.2	-3.6	7.82	10.1	-4.5	7.74	10.0	-4.4
6.45	237.4	84.6	7.08	260.6	61.4	8.29	305.3	16.7	8.11	298.7	23.3
1.40	62.5	1.6	1.40	62.5	1.6	1.40	62.5	1.6	1.40	62.5	1.6
3.68	299.9	86.2	3.97	323.1	63.0	4.51	367.8	18.3	4.43	361.2	24.9
42.57	3,468.9	277.8	42.08	3,428.1	317.6	42.25	3,442.8	303.9	42.49	3,462.2	284.5

TABLE 23.—*Estimated annual costs of moving poultry, eggs, and dairy products through facilities of costs for 1961 in*

Cost item	Volume to be handled in proposed market	Cost in present market	South Boston, sites A and B		
			Average cost per ton	Total cost	Savings
	<i>Tons</i>	<i>1,000 dollars</i>	<i>Dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
Moving commodities to dealers' facilities and handling within the market ² -----	(68,530)	708.9	6.74	462.0	246.9
Rental of facilities-----	(68,530)	154.4	3.76	258.0	—103.6
Distributing commodities:					
Within Metropolitan Boston:					
Hub Boston-----	3,504	19.6	4.88	17.1	2.5
Other Boston-----	10,541	66.0	5.29	55.8	10.2
Cambridge-Somerville-----	4,040	23.8	5.30	21.4	2.4
Northeast-----	4,646	32.8	7.08	32.9	—0.1
Northwest-----	6,485	44.7	6.49	42.1	2.6
Southwest-----	7,097	54.8	7.28	51.7	3.1
Southeast-----	5,290	41.5	6.60	34.9	6.6
Processors and food chain warehouses-----	6,951	18.6	5.29	36.8	—18.2
Total, Metropolitan Boston-----	48,554	301.8	6.03	292.7	9.1
Outside Metropolitan Boston-----	19,976	18.9	0.75	15.0	3.9
Total distribution-----	68,530	320.7	4.49	307.7	13.0
GRAND TOTAL-----	68,530	1,184.0	15.00	1,027.7	156.3

¹ Volumes given in parentheses are duplicated in other items.

² From table 19.

29 independent dealers in the proposed wholesale food distribution center for Boston, by sites, and the present market¹

Everett-Chelsea			Woburn			Natick			Canton		
Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings	Average cost per ton	Total cost	Savings
Dollars	1,000 dollars	1,000 dollars	Dollars	1,000 dollars	1,000 dollars	Dollars	1,000 dollars	1,000 dollars	Dollars	1,000 dollars	1,000 dollars
6.74	462.0	246.9	6.74	462.0	246.9	6.74	462.0	246.9	6.74	462.0	246.9
2.51	172.0	-17.6	2.31	158.0	-3.6	2.25	154.0	0.4	2.31	158.0	-3.6
5.62	19.7	-0.1	5.88	20.6	-1.0	6.91	24.2	-4.6	7.19	25.2	-5.6
6.02	63.5	2.5	6.33	66.7	-0.7	7.00	73.8	-7.8	6.92	72.9	-6.9
5.05	20.4	3.4	5.27	21.3	2.5	7.13	28.8	-5.0	6.98	28.2	-4.4
4.80	22.3	10.5	6.16	28.6	4.2	9.84	45.7	-12.9	9.77	45.4	-12.1
5.24	34.0	10.7	5.54	35.9	8.8	7.39	47.9	-3.2	7.91	51.3	-6.6
6.57	46.6	8.2	7.16	50.8	4.0	6.31	44.8	10.0	6.26	44.4	10.4
5.80	30.7	10.8	7.09	37.5	4.0	8.20	43.4	-1.9	5.54	29.3	12.2
6.01	41.8	-23.2	6.33	44.0	-25.4	7.01	48.7	-30.1	6.92	48.1	-29.5
5.75	279.0	22.8	6.29	305.4	-3.6	7.36	357.3	-55.5	7.10	344.8	-43.0
0.75	15.0	3.9	0.75	15.0	3.9	0.75	15.0	3.9	0.75	15.0	3.9
4.29	294.0	26.7	4.68	320.4	0.3	5.43	372.3	-51.6	5.25	359.8	-39.1
13.54	928.0	256.0	13.72	940.4	243.6	14.42	988.3	195.7	14.30	979.8	204.2

APPENDIX

Present Wholesale Facilities

Data relating to the volume of receipts of each food commodity, the flow of commodities through the market, and the costs of moving commodities from the first point of arrival to retail or other destinations were obtained from the U.S. Department of Agriculture Market News Service, wholesale dealers, buyers who patronized the market, truckers, railroad officials, labor union officials, representatives of the city, and others interested in the wholesale food industry in Boston.

Volume of Receipts

Estimates of the total volume of fresh fruits and vegetables, groceries, meat and meat products, and poultry and eggs arriving in the Boston area were derived from data obtained from wholesale dealers, public warehouses, poultry slaughterers, and small chain warehouses.

Records of the USDA Market News Service were used to determine some rail and truck receipts. Since these records did not reflect 100 percent of the unloads, visits were made to wholesalers in the various market areas, public warehouses, and chainstore warehouses, to determine the total receipts, by type of carrier and point of arrival. A total of 512 wholesale dealers and managers or operators of 34 public warehouses, 3 small chain warehouses, 2 meat and 9 poultry slaughtering firms, and the Boston Terminal Company were contacted. A substantial number of dealers made their log books of receipts available. Others showed their records, including gross sales and samples of invoices. In some cases estimates had to be made on the basis of average weekly or monthly sales or average weekly receipts or shipments.

No reliable records of total receipts of frozen foods and dairy products are published. The receipts, by type of carrier and point of arrival, were obtained by visiting the dealers who handled these products, including all independent wholesalers, processors, and managers or operators of chainstore warehouses and public warehouses.

Data on total receipts of each food product were reviewed for reliability by comparing them with the apparent per capita consumption and relating the consumption rate of one product to another within the city of Boston.

Flow Pattern

After the receipts of each commodity had been determined, the flow pattern was developed. This

was done by obtaining the sales pattern of a sample of dealers, which amounted to going through sales tickets (or invoices) and ascertaining the percentage of sales going to certain areas within and outside the Boston study area and to certain types of customers.

Although the volume of individual commodities sold may vary considerably throughout a year, most dealers have a relatively steady list of customers, week after week. Even if there is some degree of turnover in customers, the areas where customers are located do not change significantly from week to week.

For each commodity group, however, the situation varied, and discussions with sales managers of a number of firms were necessary to establish the most suitable days of the week and the particular weeks from which a representative sales pattern could be obtained.

Sales patterns, thus developed, showed the amounts of commodities arriving at the various market areas or terminal facilities, the movements within and between those areas or terminal facilities, and all subsequent movement until the merchandise reached retail outlets within the city or was loaded on trucks for shipment outside the Boston area.

The information obtained from the dealers (expressed in percentages) was applied to the annual volume of each commodity group handled during the year, to find the sales pattern for the given commodity by market areas.

A careful examination was necessary to avoid counting certain movements twice. The sales pattern for a market area includes sales to wholesalers in other market areas and in the same market area. These movements between wholesalers occurred mainly because a dealer was short of the product, or did not carry it, or regularly bought it from another dealer. Intermarket and intramarket movements between dealers (and public warehouses) were obtained from the distribution sample and also from receipt data obtained from dealers.

Costs

The marketing costs computed were the charges for handling the food commodities that passed through the wholesale marketing facilities of independent dealers during the year studied, *without regard to who paid the charges*. Tables 24 to 28 show the cost per ton and total costs for the volume involved for the five commodity groups by market area.

Cartage costs.—The many operations involved, the difficulties in separating the many purposes for which trucks were used, and the lack of accurate and complete cost records of cartage firms or dealers—all made it undesirable to compute cartage costs from records of a "typical" hauler. Cartage costs were determined on the basis of (1) the average elapsed time per round trip; (2) the distance traveled; (3) the cost per hour for owning (or renting) a truck; (4) the cost per hour for a driver (and his helper if one was used); (5) the operating cost of the truck per mile; and (6) bridge and tunnel tolls where applicable. These elements were combined to estimate the cost per load. The cost per ton was obtained by dividing this cost by the average tons per load.

The cost per hour of owning and renting trucks depended on the type and size of the vehicle. This cost varied substantially between the different commodity groups. The hourly truck cost was basically the fixed costs, such as depreciation, insurance, and taxes.

In addition to this cost, there was also a cost for gasoline, oil, and repair, which depended on the miles a vehicle was driven. This cost did not vary between commodity groups. The mileage cost was computed at 9 cents per mile.

Part of the hourly cost of operating a truck is the cost of the driver's time. Hourly wage rates included drivers' helpers if they were employed.

At the time of the study, Mystic River Bridge tolls were 30 cents for a van and 25 cents for a pickup. Vans were used about 80 percent of the time. Assuming that the bridge and tunnel were used equally and that 80 percent of the tonnage was moved by van, the applicable toll charge would be 30 cents each way. This charge was doubled to allow for a return trip.

Avoidable delay to trucks.—Estimates of the cost of delay to trucks and drivers hauling the products to the market areas were obtained by interviewing many dealers and drivers in the market. Traffic has been congested at some of the market places during certain hours for many years. On certain streets the traffic congestion becomes a problem during the early hours of the day. Much of this congestion is created by narrow streets and lack of space for market personnel to park their cars.

Labor costs.—Handling costs within the market included labor costs incurred at the facilities for unloading rail cars or trucks, transfers between dealers, internal handling operations, and loading buyers' trucks.

Unloading was defined as moving the merchandise from the car or truck onto the sidewalk, facility floor, platform, or, in the case of meat, overhead rail. Moving merchandise into the facility was considered an internal handling operation. However, unloading also included the moving of the merchandise from the car or truck into

the facility if this was done in one continuous operation.

Unloading rail cars at team tracks into buyers' trucks was included under labor costs for unloading within the market. Fruits and vegetables were the only commodity group to which this cost applied. A buyer made purchases from samples at the dealer's store, and the dealer then sent a worker with the buyer to the team tracks to open the car and unload the packages into the buyer's truck. The worker then returned to the store. Sometimes a worker stayed in the team-track yards and loaded items into buyers' trucks on the instructions from the sales slips. Usually, purchases from team tracks were in relatively small lots, and more man-hours were required to unload a car in this manner than when the commodity was carted to the store in much larger loads.

About 20 percent of the commodities were moved from one store to another within the same market area or from one market area to another. The cost per unit for such handling varied greatly among commodities. The cost included moving commodities from the store to a truck or other conveyance, transporting them to the buyer's store, delay time, unloading into the store, and return to dealer's store. This cost was derived in a manner similar to the costs for unloading and cartage.

Assembling orders, splitting unit loads, moving merchandise into and out of coolers, freezer units, and ripening rooms, or moving merchandise between floors were included in internal handling operations. More specialized internal handling operations, such as boning and breaking carcasses, grinding meat, and icing and re-icing boxes for poultry wholesaling were also included. Internal handling operations that involved cooking or other processing operations, on the other hand, were excluded.

Loading out included, in general, moving merchandise from a sidewalk, facility floor, platform, or overhead rail into an outbound vehicle. (Costs for the driver of the outbound vehicle, and his helper, for the time spent waiting for trucks to be loaded, were included in distribution costs.)

The total annual labor costs at the wholesale facilities (unloading, interdealer transfers, internal handling, and loading out) were obtained for a sample of each of the food commodity groups. The total annual labor costs for the sample group for each type of commodity were divided by the respective annual volume moved through the facilities, to obtain an average cost per ton.

Observations were made of the average size of load of incoming cars and trucks and the average number of man-hours required to unload. Similar information was obtained for loading outbound trucks. With this information, the per-unit costs of unloading into a facility and of loading out were derived. The internal handling costs were obtained by deducting from the total labor

TABLE 24.—Estimated annual costs of moving fresh fruits and vegetables through wholesale market facilities of independent dealers in Boston, by market area, 1961¹

Item	Totals			Faneuil Hall			South Boston			Charlestown			Other Boston		
	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost
MOVING COMMODITIES TO DEALERS' FACILITIES															
Cartage from:	Tons	Dollars	1,000 dollars	Tons	Dollars	1,000 dollars	Tons	Dollars	1,000 dollars	Tons	Dollars	1,000 dollars	Tons	Dollars	1,000 dollars
Team tracks.....	19,930	5.97	119.0	12,969	6.14	79.6	4,855	5.73	27.8	416	5.53	2.3	1,690	5.50	9.3
Boat piers.....	1,588	6.23	9.9	1,588	6.23	9.9	0	0	0	0	0	0	0	0	0
Total cartage.....	21,518	5.99	128.9	14,557	6.15	89.5	4,855	5.73	27.8	416	5.53	2.3	1,690	5.50	9.3
Avoidable delay to inbound trucks.....	(110,603)	.05	5.5	(110,603)	0.05	5.5	0	0	0	0	0	0	0	0	0
Receipts with no cartage: ²															
Rail cars on house tracks.....	190,214			9,554			110,662			47,476			22,522		
Sales from team trucks.....	150,643			617			111,598			36,738			1,690		
Trucks from shipping points.....	295,414			97,634			97,549			64,103			46,158		
Farmers' market receipts.....	7,203			7,203			0			0			0		
Total with no cartage.....	643,504			115,008			319,809			138,317			70,370		
Total rec. pts.....	665,022	.20	134.4	129,565	.73	95.0	324,664	.09	27.8	138,733	.02	2.3	72,060	.13	9.3
HANDLING WITHIN THE MARKET															
Labor:															
Unloading rail cars from:															
House tracks into stores.....	190,214	.95	179.9	9,554	1.36	13.0	110,662	1.02	112.9	47,476	.66	31.3	22,522	1.01	22.7
Team tracks to buyers' trucks.....	150,643	1.27	190.6	617	1.46	.9	111,598	1.48	165.2	36,738	.60	22.0	1,690	1.48	2.5
Unloading trucks from shipping points:															
Into stores or onto sidewalks or streets:	253,655	.92	233.2	83,757	1.06	88.8	83,819	.93	77.9	39,921	.60	24.0	46,158	.92	42.5
Into buyers' trucks.....	41,789	1.20	50.2	13,877	1.70	23.6	13,730	1.32	18.1	14,182	.60	8.5	0	0	0
Unloading trucks from team tracks and boat piers into stores ³	21,518			14,557			4,855			416			1,690		
Unloading at farmers' market.....	7,203			7,203			0			0			0		
Total unloading.....	665,022	.98	653.9	129,565	.97	126.3	324,664	1.15	374.1	138,733	.62	85.8	72,060	.94	67.7
Interdealer transfers:															
By truck unloaded onto sidewalk or into stores.....	(84,315)	6.26	528.2	(47,001)	6.09	286.1	(15,357)	6.48	99.5	(395)	5.57	2.2	(21,562)	6.51	140.4
By handtruck from store to store.....	(4,050)	3.28	13.3	(4,050)	3.28	13.3	0	0	0	0	0	0	0	0	0
Total interdealer transfers.....	(88,365)	6.13	541.5	(51,051)	5.86	299.4	(15,357)	6.48	99.5	(395)	5.57	2.2	(21,562)	6.51	140.4

Handling within stores ⁴	(553, 752)	3.90	2, 157. 6	(158, 919)	7. 03	1, 117. 2	(214, 693)	3. 38	724. 9	(88, 208)	.50	43. 9	(91, 932)	2. 95	271. 6
Loading buyers' trucks from sidewalk and stores	(553, 752)	. 92	509. 1	(158, 919)	1. 48	235. 4	(214, 693)	. 25	52. 7	(88, 208)	1. 23	108. 2	(91, 932)	1. 23	112. 8
Total labor ³	(753, 387)	5. 13	3, 862. 1	(180, 616)	9. 85	1, 778. 3	(340, 621)	3. 68	1, 251. 2	(139, 128)	1. 73	240. 1	(93, 622)	6. 33	592. 5
Other costs:															
Use of handling equipment.....	(530, 735)	. 08	42. 4	(135, 902)	. 16	21. 3	(214, 693)	. 06	12. 3	(88, 208)	. 05	4. 4	(91, 932)	. 05	4. 6
Rent.....	(530, 735)	2. 78	1, 475. 2	(135, 902)	2. 46	326. 2	(214, 693)	4. 48	961. 4	(88, 208)	. 50	43. 9	(91, 932)	1. 56	143. 7
Demurrage.....	(347, 818)	. 22	76. 5	(10, 171)	. 33	3. 4	(227, 115)	. 22	50. 0	(84, 630)	. 23	19. 5	(25, 902)	. 14	3. 6
Available spoilage.....	(665, 022)	. 77	509. 8	(129, 565)	2. 97	384. 8	(324, 664)	. 39	125. 0	(138, 733)	-----	(^e)	(72, 060)	-----	(^e)
Total other costs.....	(665, 022)	3. 16	2, 103. 9	(129, 565)	5. 68	735. 7	324, 664	3. 54	1, 148. 7	138, 733	. 49	67. 8	72, 060	2. 11	151. 9
Total handling within the market.....	665, 022	8. 97	5, 966. 0	129, 565	19. 50	2, 514. 0	324, 664	7. 39	2, 399. 9	138, 733	2. 22	307. 9	72, 060	10. 33	744. 4
DISTRIBUTING COMMODITIES ⁷															
Within Metropolitan Boston:															
Dub Boston.....	25, 401	7. 48	190. 0	15, 657	7. 09	111. 0	5, 279	8. 52	45. 0	1, 766	7. 36	13. 0	2, 609	7. 78	21. 0
Other city of Boston.....	59, 505	8. 65	515. 0	20, 876	8. 57	179. 0	19, 004	9. 10	173. 0	8, 831	8. 49	75. 0	10, 794	8. 15	88. 0
Cambridge-Somerville.....	33, 716	7. 86	265. 0	13, 570	7. 66	104. 0	6, 335	8. 83	56. 0	7, 065	7. 22	51. 0	6, 746	8. 00	54. 0
Northeast.....	37, 984	10. 56	401. 0	9, 394	9. 90	93. 0	12, 669	11. 60	147. 0	6, 476	10. 04	65. 0	9, 445	10. 16	96. 0
Northwest.....	49, 694	9. 72	483. 0	14, 613	9. 72	142. 0	14, 781	10. 69	158. 0	8, 831	9. 06	80. 0	11, 469	8. 98	103. 0
Southwest.....	48, 539	10. 96	532. 0	11, 482	11. 06	127. 0	13, 837	11. 81	187. 0	11, 775	11. 04	130. 0	9, 445	9. 32	88. 0
Southeast.....	30, 969	10. 85	336. 0	7, 307	10. 95	80. 0	13, 725	10. 93	150. 0	5, 889	10. 53	62. 0	4, 048	10. 57	41. 0
Processors.....	191	5. 24	1. 0	191	5. 24	1. 0	0	0	0	0	0	0	0	0	0
Food chain warehouses.....	50, 301	6. 84	344. 0	11, 292	5. 40	61. 0	17, 948	7. 24	130. 0	8, 243	7. 28	60. 0	12, 818	7. 26	93. 0
Total.....	336, 300	9. 12	3, 067. 0	104, 382	8. 60	898. 0	105, 578	9. 01	1, 046. 0	58, 876	9. 10	536. 0	67, 464	8. 70	587. 0
outside Metropolitan Boston.....	328, 722	1. 67	550. 0	73, 562	1. 32	97. 0	160, 344	2. 36	378. 0	72, 347	. 64	46. 0	22, 469	1. 29	29. 0
Total distribution.....	665, 022	5. 44	3, 617. 0	177, 944	5. 59	995. 0	265, 922	5. 35	1, 424. 0	131, 223	4. 44	582. 0	89, 933	6. 85	616. 0
GRAND TOTAL.....	665, 022	14. 61	9, 717. 4	129, 565	27. 82	3, 604. 0	324, 664	11. 86	3, 851. 7	138, 733	6. 43	892. 2	72, 060	19. 00	1, 369. 7

¹ Volumes given in parentheses are duplicated in other items.

² There was no cartage on these receipts, because they were unloaded into stores or sold at first point of arrival.

³ Unloading costs are included in cartage costs.

⁴ Includes cartage carted to stores, unloaded from house trucks or trucks from shipping points, and intramarket and intermarket transfers moved into stores.

⁵ Total labor costs are based upon total volume handled—direct receipts plus interdealer transfers.

⁶ Not available.

⁷ Cost for truck and driver, based on elapsed time to delivery point and return, time products were being loaded and avoidable delay due to traffic conditions. For commodities distributed outside metropolitan area, delivery point was considered to be Circumferential Route 128, and return time was not included.

TABLE 25.—*Estimated annual costs of moving groceries through the wholesale market facilities of independent dealers in Boston, by market area, 1961¹*

Item	Totals			Faneuil Hall			South Boston			Charlestown			Other Boston		
	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost
MOVING COMMODITIES TO DEALERS' FACILITIES															
Cartage from:															
Team trucks	Tons 12,701	Dollars 4.61	1,000 58.5	Tons 3,853	Dollars 4.96	1,000 19.0	Tons 4,724	Dollars 4.17	1,000 19.7	Tons 1,798	Dollars 4.12	1,000 7.4	Tons 2,346	Dollars 5.29	1,000 12.4
Boat piers	38,092	5.40	205.6	4,708	5.39	25.7	20,360	5.40	109.9	8,292	5.40	44.8	4,672	5.39	25.2
Total cartage	50,793	5.20	264.1	8,601	5.20	44.7	25,084	5.17	129.6	10,090	5.17	52.2	7,018	5.36	37.6
Receipts with no cartage: ²															
House tracks into stores	77,153			2,550			11,297			12,931			50,375		
House tracks into public warehouses	135,393			1,000			48,852			74,375			11,166		
Trucks from shipping points	272,035			24,989			54,741			60,636			132,269		
Total receipts with no cartage	484,581			28,539			114,890			147,342			193,810		
Total receipts	535,374	.49	264.1	37,140	1.20	44.7	139,974	.93	129.6	157,432	.33	52.2	200,828	.19	37.6
HANDLING WITHIN THE MARKET															
Labor:															
Unloading rail cars from house tracks and trucks from shipping points into stores and public warehouses	349,188	2.51	875.7	27,539	3.80	104.6	66,038	1.75	115.6	72,967	2.10	153.2	182,644	2.75	502.3
Unloading trucks from team tracks and boat piers into stores ³	50,793			8,601			25,084			10,090			7,018		
Total unloading ⁴	399,981	2.19	875.7	36,140	2.89	104.6	91,122	1.27	115.6	83,057	1.84	153.2	189,662	2.65	502.3
Interdealer transfers from:															
Other dealers	(19,560)	3.86	75.5	(7,084)	4.05	28.7	0			(665)	3.76	2.5	(11,811)	3.75	44.3
Public warehouses	(71,892)	3.77	270.9	(11,640)	3.10	36.1	(9,053)	3.18	28.8	(4,527)	3.76	17.0	(46,672)	4.05	189.0
Total interdealer transfers	(91,452)	3.79	346.4	(18,724)	3.46	64.8	(9,053)	3.18	28.8	(5,192)	3.76	19.5	(58,483)	3.99	233.3
Handling within stores ⁵	(401,433)	5.09	2,500.2	(54,864)	7.55	414.2	(100,175)	3.50	350.6	(88,240)	4.20	370.6	(248,145)	5.50	1,364.8
Loading buyers' trucks	(401,433)	1.89	929.3	(54,864)	2.80	153.6	(100,175)	1.30	130.2	(88,249)	1.55	136.8	(248,145)	2.05	508.7
Total labor ⁶	(401,433)	9.47	4,051.6	(54,864)	13.44	737.2	(100,175)	6.24	625.2	(88,249)	7.71	680.1	(248,145)	10.51	2,609.1

	(491,433)	-20	98.4	(54,864)	-19	10.6	(100,175)	-19	19.4	(88,249)	-28	24.4	(248,145)	-18
Other costs:														
Use of handling equipment ?	(491,433)	1.62	795.1	(54,864)	2.47	135.7	(100,175)	.96	95.7	(88,249)	.92	81.1	(248,145)	1.94
Rentals :	(225,247)	-0.05	10.8	(7,383)	-0.11	8	(64,873)	.02	1.5	(89,104)	.02	1.8	(63,887)	6.7
Damages :	(264,432)	5.73	1,515.5	(2,080)	9.18	19.1	(89,329)	5.22	466.1	(116,827)	6.01	702.6	(56,196)	5.83
Public warehouse service charges.														
Total other costs.	535,374	4.52	2,419.9	37,140	4.47	106.2	139,974	4.16	582.7	157,432	5.14	809.9	200,828	4.29
Total handling within the market.....	535,374	13.21	7,071.5	37,140	24.32	903.4	139,974	8.63	1,207.9	157,432	9.46	1,490.0	200,828	17.28
DISTRIBUTING COMMODITIES *														
Within metropolitan Boston														
Hub Boston.....	17,612	8.11	142.8	3,526	7.97	28.1	3,335	8.28	27.6	3,635	8.14	29.6	7,116	8.08
Other City of Boston.....	70,220	8.12	570.2	10,577	8.98	95.0	7,338	8.68	63.7	10,906	8.92	97.3	41,399	7.59
Camber City-Somerville.....	32,078	8.73	280.1	3,134	8.36	26.2	2,001	8.70	17.4	15,208	8.13	124.1	11,675	9.63
Northeast.....	40,563	9.87	400.4	4,701	9.21	43.3	4,336	10.40	45.1	14,541	9.85	143.5	16,985	10.85
Southeast.....	54,371	9.29	505.3	6,660	9.07	60.4	9,005	9.79	88.2	6,543	9.25	163.0	32,163	9.21
Southwest.....	46,588	9.80	456.7	6,268	9.72	60.9	3,002	10.56	31.7	14,541	10.50	132.7	22,777	9.57
Food chain warehouses.....	29,104	10.34	301.9	4,308	10.63	45.8	4,336	9.96	43.2	7,272	10.34	73.2	13,278	10.77
Total.....	385,050	8.06	2,943.6	39,918	9.09	362.8	66,752	6.68	445.8	101,047	7.83	791.4	157,333	45.7
Outside metropolitan Boston.....	170,324	1.12	190.6	11,988	1.47	17.6	44,252	1.11	43.1	23,734	1.11	26.3	90,350	1.08
Total distribution.....	535,374	5.85	3,134.2	51,906	7.33	380.4	111,004	4.46	494.9	124,781	6.55	817.7	247,683	5.82
GRAND TOTAL.....	535,374	19.56	10,469.8	37,140	35.77	1,328.5	139,974	13.09	1,832.4	157,432	14.99	2,359.9	200,828	24.64

1 Volumes given in parentheses are duplicated in other items.
 2 There were no cartage costs on these receipts because they were unloaded into facilities at first point of arrival.
 3 Unloading costs are included in cartage costs.
 4 Total unloaded into stores plus unloaded into public warehouses equals total receipts.
 5 Total unloaded into stores plus intermarket transfers, less the tonnages distributed from public warehouses.
 6 Total labor costs are based on tonnage handled within stores.
 7 Based upon tonnage handled within stores.
 8 Based upon total rail receipts.
 9 Cost for truck and driver, based on elapsed time to delivery point and return, time products were being loaded, and avoidable delay due to traffic conditions. For commodities distributed outside metropolitan area, delivery point was considered to be Circumferential Route 128, and return time was not included.

^a Based upon direct rail receipts.

Cost for truck and driver, based on elapsed time to delivery point and return, time products were being loaded and avoidable delay due to traffic conditions. For commodities distributed outside

metropolitan area, delivery point was considered to be Circumferential Route 128, and return time

was not included.

^e Total labor costs are based on tonnage handled within stores.

⁷ Based upon tonnage handled within stores.

* Cost for truck and driver, based on elapsed time to delivery point and return, time products were based upon direct rail receipts.

being loaded, and avoidable delay due to traffic conditions. For commodities distributed outside the metropolitan area, delivery point was considered to be Circumferential Route 128, and return time was not included.

TABLE 26.—*Estimated annual costs of moving meat and meat products through the wholesale market facilities of independent dealers in Boston, by market area, 1961¹*

Item	Totals			Faneuil Hall			South Boston			Charlestown			Other Boston		
	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost
MOVING COMMODITIES TO DEALERS' FACILITIES															
Cartage from:															
Team tracks:	Tons	Dollars	1,000 dollars	Tons	Dollars	1,000 dollars	Tons	Dollars	1,000 dollars	Tons	Dollars	1,000 dollars	Tons	Dollars	1,000 dollars
Boat piers:	34,393	4.40	151.2	6,715	4.39	29.5	780	4.36	3.4	24,527	4.40	107.9	2,371	4.39	10.4
	6,178	4.40	27.2	1,038	4.43	4.6	2,600	4.38	11.4	0			2,540	4.41	11.2
Total cartage:	40,571	4.40	178.4	7,753	4.40	34.1	3,380	4.38	14.8	24,527	4.40	107.9	4,911	4.40	21.6
Avoidable delay to inbound trucks ² :	(38,908)	.04	1.6	(38,908)	.04	1.6	0			0			0		
Receipts with no cartage: ³															
House tracks into stores:	185,964			10,757			142,506			11,898			20,803		
Trucks from shipping points:	216,792			38,908			94,891			12,450			70,543		
Total with no cartage:	402,756			49,665			237,397			24,348			91,346		
Total receipts:	443,327	.41	180.0	57,418	.62	35.7	240,777	.06	14.8	48,875	2.21	107.9	96,257	.22	21.6
HANDLING WITHIN THE MARKET															
Labor:															
Unloading rail cars from house tracks and trucks from shipping points:	402,756	1.55	623.0	49,665	1.76	87.4	237,397	1.52	360.8	24,348	1.55	37.7	91,346	1.50	137.1
Unloading trucks from team tracks and boat piers ⁴ :	40,571			7,753			3,380			24,527			4,911		
Total unloading:	443,327	1.41	623.0	57,418	1.52	87.4	240,777	1.50	360.8	48,875	.77	37.7	96,257	1.42	137.1
Interdealer transfers from:															
Other dealers:	145,631	3.38	492.5	(67,231)	4.08	274.4	(44,076)	2.11	93.1	(2,557)	3.48	8.9	(31,767)	3.65	116.1
Public warehouses:	(3,425)	4.41	15.1	(500)	4.40	2.2	(2,925)	4.41	12.9	0			0		
Total interdealer transfers:	(149,056)	3.41	507.6	(67,731)	4.08	276.6	(47,001)	2.26	106.0	(2,557)	3.48	8.9	(31,767)	3.65	116.1

Handling within stores ¹	20.26	11,911.8	(125,149)	22.63	2,832.1	(287,778)	19.17	5,516.7	(51,432)	24.29	1,249.3	(123,464)	18.74	2,313.7
Loading buyers' trucks	1.97	1,156.1	(125,149)	2.41	301.6	(287,778)	1.78	512.2	(51,432)	2.07	106.5	(123,464)	1.91	233.8
Total labor ⁶	24.15	14,198.5	(125,149)	27.95	3,497.7	(287,778)	22.57	6,495.7	(51,432)	27.27	1,402.4	(123,464)	22.70	2,802.7
Other costs:														
Use of handling equipment ⁶	06	33.5	(125,149)	08	9.7	(287,778)	06	17.2	(51,432)	03	1.6	(123,464)	04	5.0
Rent ⁶	5.10	2,999.1	(125,149)	6.86	858.6	(287,778)	4.93	1,419.7	(51,432)	4.61	237.0	(123,464)	3.92	483.8
Demurrage ⁷	1.21	247.1	(17,472)	50	8.8	(143,286)	1.12	161.0	(36,425)	2.02	73.5	(23,174)	1.03	23.8
Public warehouse service charges ⁸	19.20	605.3	(500)	19.20	9.6	(2,925)	19.21	56.2	0			(28,100)	19.20	539.5
Total other	443.327	3,905.0	57,418	15.44	886.7	240,777	6.87	1,654.1	48,875	6.39	312.1	96,257	10.93	1,052.1
Total handling within the market	443.327	18,103.5	57,418	76.36	4,384.4	240,777	33.85	8,149.8	48,875	35.08	1,714.5	96,257	40.05	3,854.8
DISTRIBUTING COMMODITIES ⁹														
Within Metropolitan Boston														
Inn Boston	13,644	7.74	105.6	10.54	59.1	4,045	5.54	22.4	721	5.69	4.1	3,270	6.12	20.0
Other City of Boston	46,639	8.21	382.7	13.12	167.2	10,617	6.57	69.8	2,262	6.44	14.7	20,994	6.24	131.0
Cambridge-Somerville	17,374	7.65	132.9	11.57	59.0	3,539	5.99	21.2	1,561	5.57	8.7	7,176	6.13	44.0
Northeast	36,373	9.16	6,118	15.27	93.4	9,606	7.96	76.5	1,801	7.38	13.3	12,848	7.39	94.9
Northwest	36,749	8.69	319.4	14.98	122.2	9,104	7.49	68.2	2,522	6.74	17.0	16,969	6.60	112.0
Southwest	29,299	10.41	304.2	17.36	150.5	7,584	7.96	60.4	2,162	8.00	17.3	10,795	7.04	76.0
Southeast	19,115	10.01	191.4	17.37	79.7	6,067	7.80	47.3	960	7.71	7.4	7,499	7.60	57.0
Food chain warehouses	7,020	4.32	30.3	5.20	6.2	4,212	3.87	16.3	35	2.86	1	1,580	4.87	7.7
Total	200,123	8.72	1,744.6	14.13	737.3	54,771	6.98	382.1	12,044	6.86	82.6	81,131	6.69	542.6
Outside Metropolitan Boston	243,204	1.43	347.4	1.99	101.0	146,318	1.28	187.3	10,127	1.28	13.0	36,015	1.28	46.1
Total distribution	443,327	4.72	2,092.0	8.15	838.3	201,089	2.83	569.4	22,171	4.31	95.6	117,146	5.03	588.7
GRAND TOTAL	443,327	45.96	20,375.5	91.58	5,258.4	240,777	36.27	8,734.0	48,875	39.24	1,918.0	96,257	46.39	4,465.1

¹ Volumes given in parentheses are duplicated in other items.

² Trucks in Faneuil Hall area only.

³ There were no cartage costs on these receipts because they were unloaded into stores or warehouses at first point of arrival.

⁴ Unloading costs included in cartage costs.

⁵ Total unloaded plus intermarket transfers, less the tonnage distributed from public warehouses.

⁶ Based upon tonnage handled within stores.

⁷ Based on: tonnage of rail receipts.

⁸ Based on amount stored in warehouses.

⁹ Cost for truck and driver, based on elapsed time to delivery point and return, time products were being loaded, and avoidable delay due to traffic conditions. For commodities distributed outside metropolitan area, delivery point was considered to be Circumferential Route 128, and return time was not included.

TABLE 27.—Estimated annual costs of moving poultry, eggs, and dairy products through the wholesale market facilities of independent dealers in Boston, by market area, 1961¹

Item	Totals			Faneuil Hall			South Boston			Charlestown			Other Boston		
	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost	Volume	Cost per ton	Total cost
MOVING COMMODITIES TO DEALERS' FACILITIES															
Cartage from:	Tons	Dollars	1,000 dollars	Tons	Dollars	1,000 dollars	Tons	Dollars	1,000 dollars	Tons	Dollars	1,000 dollars	Tons	Dollars	1,000 dollars
Team tracks.....	8,661	2.52	21.8	2,925	2.67	7.8	1,275	2.43	3.1	3,681	2.39	8.8	780	2.69	2.1
Boat piers.....	3,143	2.32	7.3	3,018	2.32	7.0	0			0			125	2.40	.3
Total cartage.....	11,804	2.47	29.1	5,943	2.49	14.8	1,275	2.43	3.1	3,681	2.39	8.8	905	2.65	2.4
Avoidable delay to inbound trucks ²	(44,684)	.04	1.7	(44,684)	.04	1.7	0	0	0	0	0	0	0	0	0
Receipts with no cartage: ³															
Rail cars on house tracks.....	9,639			5,553			300			512			3,274	0	0
Trucks from shipping points.....	124,173			44,684			23,275			10,994			45,220	0	0
Total receipts with no cartage.....	133,812			50,237			23,575			11,506			48,494	0	0
Total receipts.....	145,616	.21	30.8	56,180	.29	16.5	24,850	.12	3.1	15,187	.58	8.8	49,399	.05	2.4
HANDLING WITHIN THE MARKET															
Labor:															
Unloading rail cars from house tracks and trucks from shipping points.....	127,123	.94	120.0	46,314	1.16	53.6	23,575	.90	21.2	11,506	.70	8.1	45,728	.81	37.1
Unloading trucks from team tracks and boat piers ⁴	11,804			5,943			1,275			3,681			905	0	0
Total unloading.....	138,927	.86	120.0	52,257	1.03	53.6	24,850	.85	21.2	15,187	.53	8.1	46,633	.80	37.1
Interdealer transfers from:															
Other dealers.....	(12,434)	2.40	29.9	(9,501)	2.47	23.5	(2,073)	2.12	4.4	(216)	2.31	.5	(644)	2.33	1.5
Public warehouses.....	(1,621)	2.22	3.6	(1,051)	2.28	2.4	(439)	2.05	.9	0			(131)	2.29	.3
Total interdealer transfers.....	(14,055)	2.38	33.5	(10,552)	2.45	25.9	(2,512)	2.11	5.3	(216)	2.31	.5	(775)	2.32	1.8

Handling within stores ¹	(152, 982)	4.86	743.3	(62, 809)	6.70	420.8	(27, 362)	4.36	119.3	(15, 403)	3.25	50.1	(47, 408)	3.23	153.1
Loading buyers' trucks-----	(152, 982)	1.35	206.2	(62, 809)	1.75	109.9	(27, 362)	1.02	27.9	(15, 403)	1.30	20.0	(47, 408)	1.02	48.4
Total labor ² -----	(152, 982)	7.21	1, 103.0	(62, 809)	9.72	610.2	(27, 362)	6.35	173.7	(15, 403)	5.11	78.7	(47, 408)	5.07	240.4
Other costs:															
Use of handling equipment ³	(152, 982)	.05	7.1	(62, 809)	.04	2.5	(27, 362)	.05	1.4	(15, 403)	.05	.8	(47, 408)	.05	2.4
Rent ⁴	(152, 982)	2.14	328.1	(62, 809)	2.55	157.0	(27, 362)	1.45	39.7	(15, 403)	2.50	38.5	(47, 408)	1.96	92.9
Public warehouse service charges ⁵	(25, 137)	14.54	365.5	(14, 523)	15.22	221.0	(439)	7.06	3.1	0			(10, 175)	13.90	141.4
Total other costs-----	145, 616	4.81	700.7	56, 180	6.77	380.5	24, 850	1.78	44.2	15, 187	2.59	39.3	49, 399	4.79	236.7
Total handling within the market ----	145, 616	12.39	1, 803.7	56, 180	17.63	990.7	24, 850	8.77	217.9	15, 187	7.77	118.0	49, 399	9.66	477.1
DISTRIBUTING COMMODITIES ⁶															
Within Metropolitan Boston:															
Hub Boston-----	7, 440	5.60	41.7	5, 019	5.52	27.7	786	5.47	4.3	278	5.76	1.6	1, 357	5.97	8.1
Other Boston-----	22, 379	6.26	140.2	12, 724	6.44	81.9	2, 844	5.56	15.8	2, 496	6.37	15.9	4, 315	6.16	26.6
Cambridge-Somerville-----	8, 577	5.89	50.5	2, 313	5.88	13.6	854	5.96	3.9	2, 630	5.63	14.8	2, 984	6.11	8.2
Northwest-----	9, 865	7.38	72.8	1, 921	7.13	13.7	1, 833	7.64	14.0	2, 074	7.33	15.2	4, 037	7.11	23.9
Southwest-----	13, 769	6.89	94.9	3, 079	7.15	22.0	2, 749	7.20	17.8	3, 322	6.68	22.2	4, 619	6.60	30.9
Southeast-----	15, 068	7.72	116.4	8, 096	7.95	64.4	2, 226	7.64	17.0	2, 352	7.87	18.5	2, 304	6.89	26.5
Processors-----	11, 231	7.84	88.1	5, 393	7.94	42.8	1, 964	7.48	14.7	2, 693	7.65	5.3	3, 181	7.95	23.5
Food chain warehouses-----	11, 065	2.63	2.8	403	2.98	1.2	0			0				2.42	1.6
Total-----	13, 692	2.69	36.8	7, 741	2.89	22.4	304	2.30	.7	854	2.46	2.1	4, 793	2.42	11.6
Outside Metropolitan Boston-----	103, 086	6.25	644.2	46, 689	6.20	289.7	13, 360	6.75	90.2	14, 699	6.50	95.6	28, 338	5.95	168.7
Total-----	42, 530	.94	40.1	11, 157	1.12	12.5	11, 221	.62	7.0	0			20, 152	1.02	20.6
Total distribution-----	145, 616	4.70	684.3	57, 846	5.22	302.2	24, 581	3.95	97.2	14, 699	6.50	95.6	48, 490	3.90	189.3
GRAND TOTAL-----	145, 616	17.30	2, 518.8	56, 180	23.31	1, 309.4	24, 850	12.80	318.2	15, 187	14.64	222.4	49, 399	13.54	668.8

¹ Volumes given in parentheses are duplicated in other items.

² Truck receipts in Faneuil Hall area only.

³ There were no cartage costs on these receipts because they were unloaded into facilities at first

point of arrival.

⁴ Unloading costs are included in cartage costs.

⁵ Total unloaded into stores plus interdealer transfers.

⁶ Based on volume handled within stores.

⁷ Based on volume stored in warehouses.

⁸ Cost for truck and driver, based on elapsed time to delivery point and return, time products were being loaded, and avoidable delay due to traffic conditions. For commodities distributed outside metropolitan area, delivery point was considered to be Circumferential Route 128, and return time was not included.

TABLE 28.—*Estimated annual costs of moving frozen food through the wholesale market facilities of independent dealers in Boston, 1961*¹

Item	Volume ²	Average cost per ton	Total cost
MOVING COMMODITIES TO DEALERS' FACILITIES			
	<i>Tons</i>	<i>Dollars</i>	<i>1,000 dollars</i>
Cartage from Boston processors.....	4, 128	7. 61	31. 4
Receipts with no cartage: ³			
Rail cars on house tracks.....	46, 906		
Trucks from shipping points.....	57, 188		
Total receipts.....	108, 222	2. 90	31. 4
HANDLING WITHIN THE MARKET			
Labor:			
Unloading rail cars from house tracks.....	(46, 906)	1. 40	65. 7
Unloading trucks.....	(57, 188)	1. 40	80. 1
Handling within facilities.....	(108, 222)	5. 60	606. 0
Loading buyers' trucks.....	(108, 222)	1. 40	151. 5
Total labor costs.....	108, 222	8. 35	903. 3
Other costs:			
Rent.....	(108, 222)	7. 53	815. 4
Demurrage.....	(46, 906)	. 13	6. 3
Total other costs.....	108, 222	7. 59	821. 7
Total handling in the market.....	108, 222	15. 94	1, 725. 0
DISTRIBUTING COMMODITIES ⁴			
Within Metropolitan Boston:			
Hub Boston.....	17, 288	8. 54	147. 6
Other Boston.....	10, 092	8. 73	88. 1
Cambridge-Somerville.....	8, 410	8. 66	72. 8
Northeast.....	2, 290	10. 04	23. 0
Northwest.....	2, 383	9. 32	22. 2
Southwest.....	2, 336	9. 50	22. 2
Southeast.....	2, 803	10. 63	29. 8
Processors.....	1, 122	7. 75	8. 7
Food chain warehouses.....	26, 250	7. 77	204. 0
Total.....	72, 974	8. 47	618. 4
Outside Metropolitan Boston.....	35, 248	1. 40	49. 3
Total distribution.....	108, 222	6. 17	667. 7
GRAND TOTAL.....	108, 222	22. 40	2, 424. 1

¹ Frozen food was received primarily in the market area described as Other Boston.

² Volumes given in parentheses are duplicated in other items.

³ There were no cartage costs on these receipts because they were unloaded into facilities at first point of arrival.

⁴ Cost for truck and driver, based on elapsed time to delivery point and return, time products were being loaded, and avoidable delay due to traffic conditions. For commodities distributed outside metropolitan area, delivery point was considered to be Circumferential Route 128, and return time was not included.

charges for all handling operations, the per-unit costs of unloading and loading out.

Use of handling equipment.—Except in the more efficient meat handling and frozen food facilities and some of the large-volume egg wholesale stores, very little handling equipment was used in wholesale facilities. The operating costs, depreciation, and maintenance of such equipment as forklift trucks and electric and hydraulic jacks were furnished by the firms using the devices. For the other equipment (pallets, dead and semi-live skids, two-wheel and four-wheel handtrucks),

estimates were made of the original cost and average life.

With this information, together with the volume of each commodity so handled, a cost per unit for handling equipment was computed.

Rent.—Rental costs were obtained from each wholesale dealer in the city. If a dealer rented the facility, he gave his rental cost; if he owned his facility, he was asked to estimate his rental cost. If this information was not available his rent was based on similar facilities in that market area.

Public warehouse service charges for food storage.—The size, weight, and type of package or container, the type of commodity, and the period of time in storage determined the average charges per hundredweight that wholesale dealers paid for storing or handling of products in public warehouses. Warehouse charges were obtained from managers of warehouses. The charges included unloading rail cars, moving merchandise into and out of storage, and loading it out on trucks. For each commodity group stored, an average warehouse charge was calculated that included the period of time that the commodity was stored.

Demurrage.—The amount of demurrage paid was a very small part of total marketing costs and only three commodity groups incurred demurrage (fruits and vegetables, meat and meat products, and groceries). Many fruit and vegetable dealers intentionally held perishable items in refrigerated cars and paid demurrage because they had no cooler space in their facilities. Some meat wholesalers incurred demurrage when their inventories were moving slowly. Some large-volume independent grocery dealers often made "bargain purchases" in large quantities and incurred demurrage, because of lack of immediate storage space when the goods were received.

Actual costs for demurrage were furnished by the railroads and the dealers.

Avoidable spoilage.—Avoidable spoilage costs were costs for losses by waste and deterioration incurred because of inadequate facilities and poor or excessive handling. Data on costs of avoidable spoilage were assembled from (1) a number of wholesale dealers who kept records on waste and deterioration (some dealers figured a certain amount of loss in determining markup; only part of this loss was avoidable); (2) estimates of waste observed around facilities; and (3) information furnished by garbage collectors.

Considerable losses through breakage occurred at stores where merchandise was unloaded from trucks by hand onto sidewalks. Additional breakage occurred inside stores when merchandise was shifted from one location to another. Rehandling and prolonged "shelf time" when a sale was not made, together with lack of proper storage space, contributed to spoilage. Lack of coolers, or insufficient cooler space during the summer, and inadequate protection from inclement weather in the winter, also were found to cause losses.

Distributing commodities.—In developing costs for distributing commodities four primary factors were measured: the average size load, average truck operation cost per hour, average wage rates of drivers and helpers, and the average elapsed time from market to delivery point and return. For commodities distributed outside the metropolitan area, State Circumferential Route 128 was considered to be the delivery point, and return was not included.

Data used to determine the average load from stores to various delivery points were collected from a sample of dealers in each commodity group. The average cost of truck ownership and operation was developed from the records of these dealers and truck rental companies. The wages of drivers and helpers depended on whether or not the firm was unionized. When a helper was used, this was taken into consideration. The average cost per mile was established on the average speed and total elapsed time.

It was found that the average speed was 13 miles per hour on downtown streets, 19 miles per hour on urban arterial highways, 23 miles per hour on suburban arterial highways, and 35 miles per hour on expressways. These speeds were derived from observing delivery vehicles and from a transportation study conducted by Boston College.⁷

The average elapsed time per trip was the sum of the time the driver actually spent at each delivery stop (nonmoving time) and time spent getting to the delivery area, between stops, and return (moving time). Delay time was included. As part of the computation of the cost of distribution, the average number of stops and the length of time at and between each stop was computed for a sample of loads. No reference was made to whether or not the delivery vehicle belonged to a dealer or to the purchaser. In general, the average times were remarkably similar between commodities.

The distance traveled from each market was computed from round trip delivery time. The method used to derive the cost per ton for delivery was wage rates for driver times round trip time including stops and delay plus the operating cost for the truck per mile times the miles traveled divided by the average load in tons.

Costs in the Proposed Facilities

Detailed marketing cost estimates, by commodity groups, for a proposed food distribution center for the Boston metropolitan area are shown in tables 20 through 23. The proposed market center is assumed to have adequate facilities to handle the 908,000 tons of food commodities received by the 303 independent wholesalers whose facilities were being taken by urban renewal or were in need of replacement.

Facilities have been planned for a refrigerated warehouse, two dry storage firms, and two chain-stores warehouses. These organizations will need to relocate, or they have indicated a desire to locate on a food center with new, efficient warehouses of modern design from which they could more efficiently serve their customers. Possible annual savings were not developed for these firms; however, it is thought that they would accrue savings.

⁷ Boston College Seminar Research Bureau. STUDY OF URBAN TRANSPORTATION VOLUME IN TRIP DESTINATION PROCEDURES. 87 pp. illus. 1960.

The estimated cost data were collected from other cities with modern facilities that closely resemble the types of facilities proposed for the Boston wholesale distribution center. The estimated costs for handling each of the commodity groups through a new center were computed from a composite of these costs adjusted to Boston rates.

With adequate handling space in modern facilities, it is assumed that no demurrage charges would be incurred in a new food distribution center.

The avoidable spoilage with efficient handling equipment and adequate storage and cooler space would be negligible in new facilities.

The public warehouse charges in a modern food distribution center are based upon the rates in effect at the time of the study. In new facilities wholesale dealers would have adequate space for day-to-day operations. They would use such facilities to store reserve stocks or to hold items in periods of oversupply.

The total annual rent for each commodity is based upon the total annual revenue required to amortize the investment cost of land and facilities and to pay real estate taxes at each site and operating expenses for a wholesale food distribution center. These rental charges vary with the site and the commodity.

The average cost of transporting products from the proposed center to retail outlets, processors, or chainstores is based upon the cost of this operation in the present market areas. It is assumed that use of more efficient facilities and the elimination of traffic congestion would reduce these costs. As previously described, four factors were used in determining these costs: an average size load, average truck operation cost per hour, average wage rates, and elapsed time from site to point of delivery and return.

In the new facilities the amount of each commodity sold by one firm to another in the market would vary depending on the particular food commodity. For meats, the hotel and restaurant supply firms and meat processors depend upon the wholesalers for a large amount of their supplies. Some fresh fruits and vegetable repackers also depend on the large-volume receivers for part of their supplies. Other commodity groups' transfers are between firms specializing or are caused by off-season shortage or needs to fill customers' orders. These costs would be reduced because transfers could often be effected by moving the commodities down a platform.

The amount of food commodities that are handled within the stores varies, depending on the commodity. In the proposed facilities it was assumed that all receipts would be restacked, sorted, repacked, or moved into or out of the cooler and ripening rooms. The proposed one-floor operation would substantially reduce these costs. The cost per ton of loading all commodities would be less from the new facilities because the platforms would be the height of rail car floors or truckbeds and handling equipment would be used.

The charge for use of handling equipment is based upon the cost of such equipment, its expected life, and its maintenance cost. It is assumed that in a modern market the wholesale food firms would use more handling equipment than they do in present facilities; consequently, the total cost of this item is expected to be greater than previously incurred.

There would probably be a slight increase in the cost per ton of carting fresh fruits and vegetables from boat piers because they would be carted a greater distance than they are now. Cartage for groceries would decrease in cost per unit because larger volumes could be moved to the improved facilities. It can be assumed that with house tracks provided for the facilities that receive rail car shipments, cartage from team tracks could be reduced or eliminated.

Avoidable delay caused by traffic congestion in the market could be eliminated in a modern food distribution center because of wide streets and ample parking areas. The amount of commodities that would arrive on house tracks in a new facility would be greater than the present volume. This increase would be due to a decrease in team track receipts.

The costs of unloading into dealers' stores, of internal handling, and of loading out to trucks are based on information obtained from the operators of modern facilities, as previously described. The internal arrangement of the recommended facilities, together with the convenient heights of the platforms and use of handling equipment, would reduce the present cost.

Because the cost of unloading at retail stores or other destinations will not change if a new market area is developed, they were not recomputed.

The cost of loading trucks that haul products out of Boston would be reduced because loading operations would be less costly and delay would be eliminated. In determining the savings on this item only, a reduction in delay was considered.

SPACE FOR
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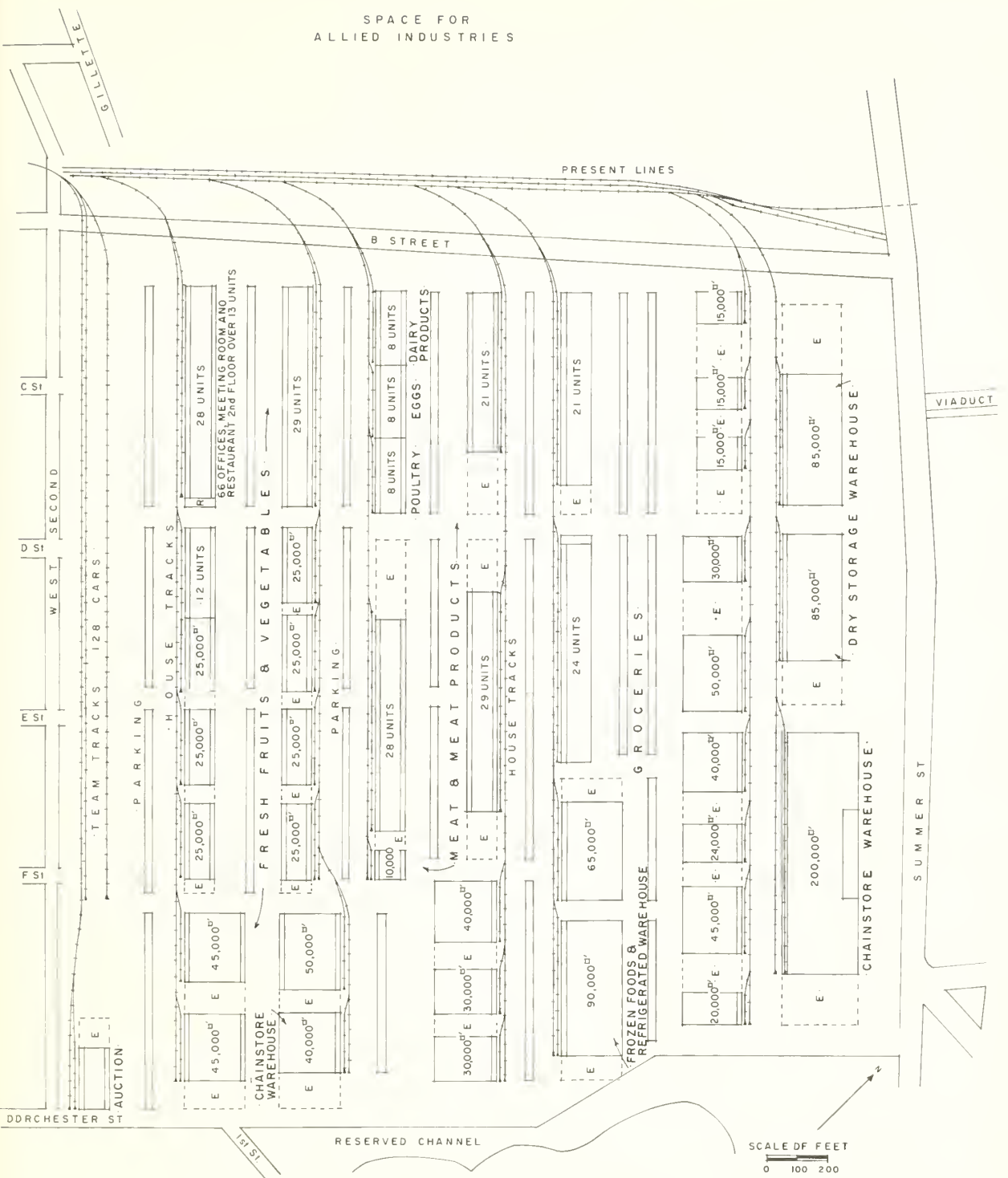
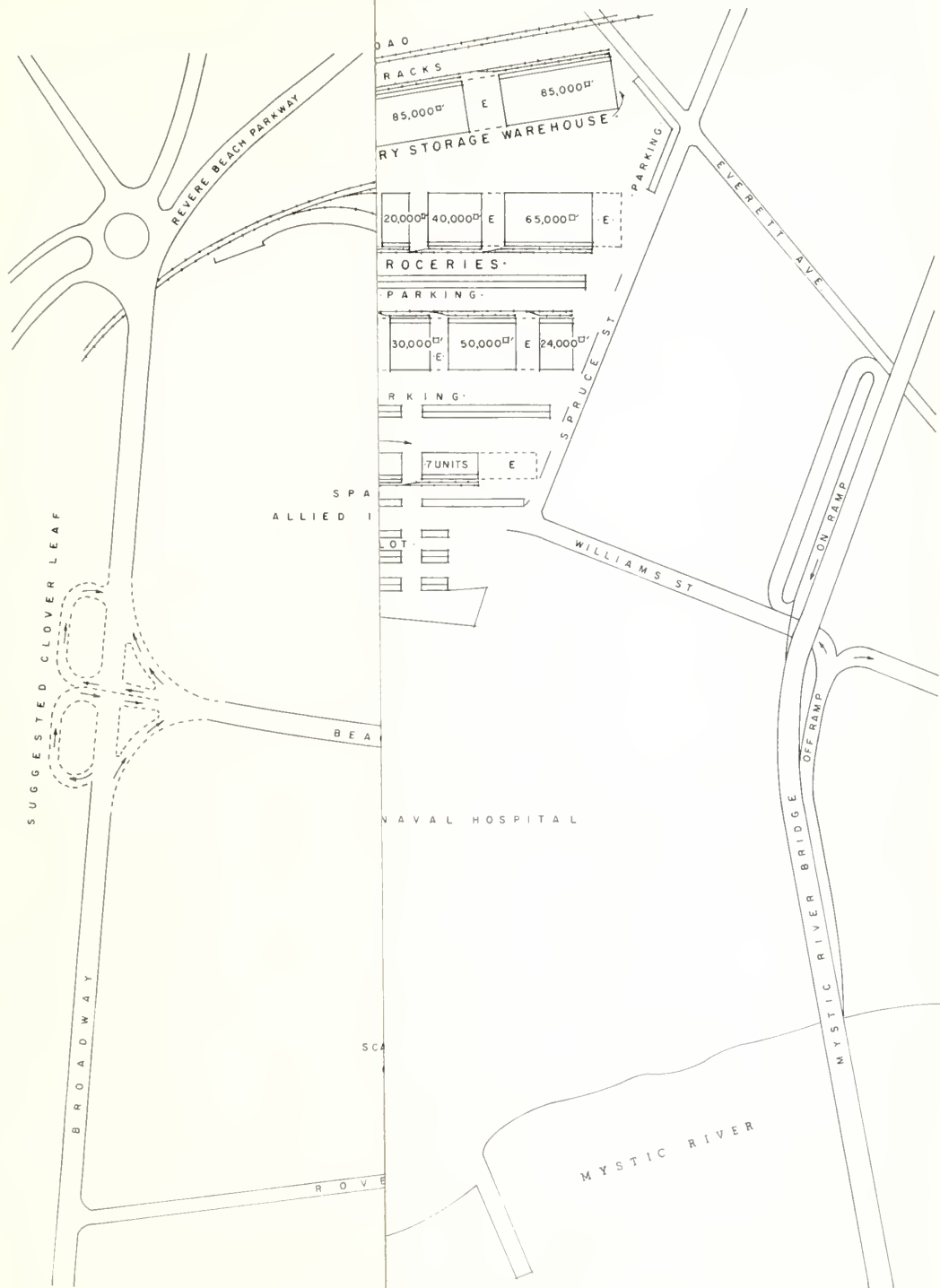


FIGURE 25.—Layout of the proposed food distribution center, South Boston site A.



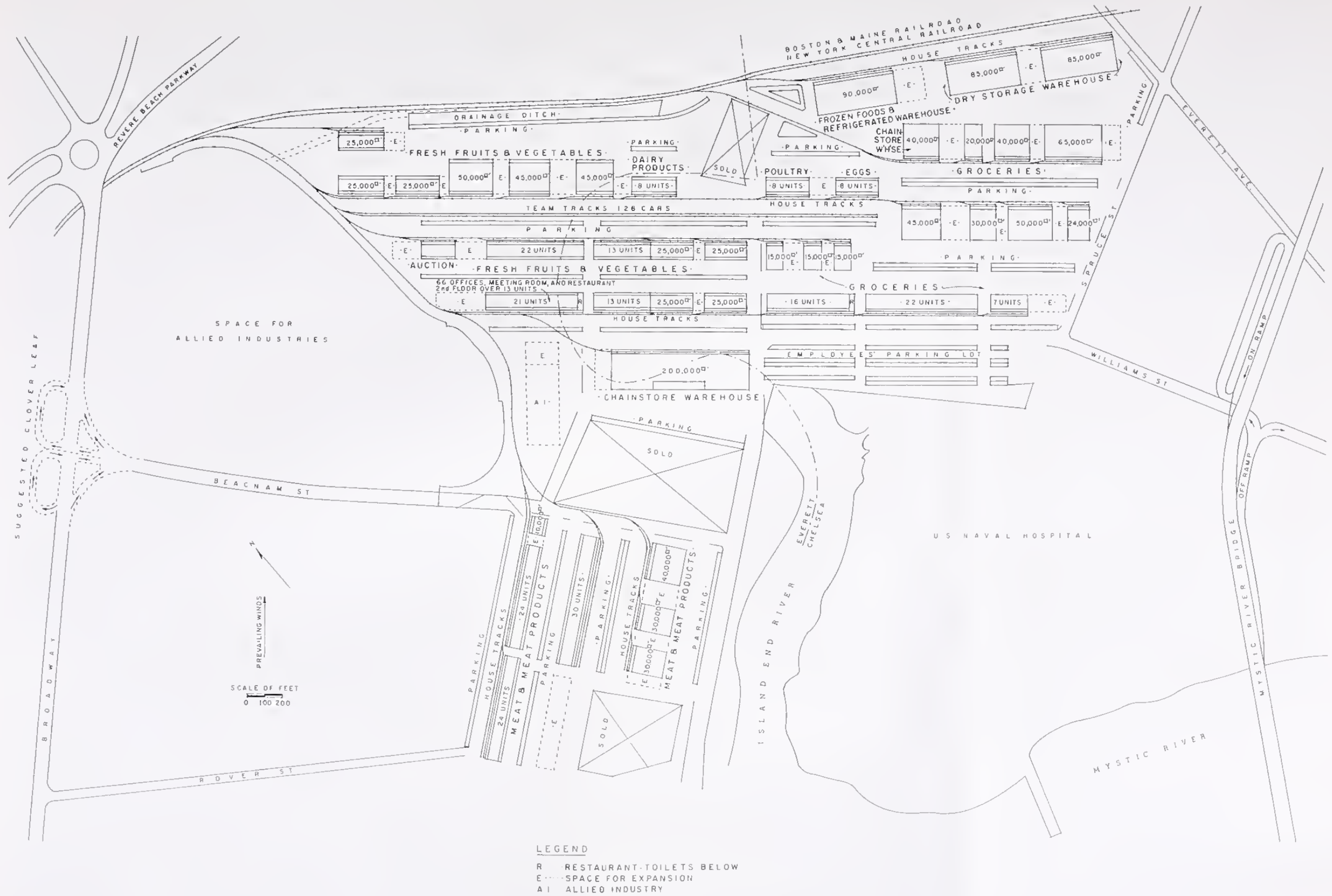


FIGURE 27.—Layout of the proposed food distribution center, Everett-Chelsea.

